P5 Solutions

Note: In all solution, u represents units and p represents parts.

Answer to Unit 1.1

Let's Get Started 1.1

2.

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
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</tbody>
</table>

3.

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<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>D</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>G</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

120

Ask yourself

1. There are 80 more men than women at first.

Let's Practise 1.1

Question 1

At first

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>20</td>
</tr>
<tr>
<td>R</td>
<td></td>
</tr>
</tbody>
</table>

End

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>1u</td>
</tr>
<tr>
<td>R</td>
<td>2u</td>
</tr>
</tbody>
</table>

2u = 32
1u = 32 ÷ 2
= 16
1u + 52 = 16 + 52
= 68
Bernard had $68 at first.

Question 2

At first

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>60</td>
</tr>
<tr>
<td>R</td>
<td></td>
</tr>
</tbody>
</table>

End

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>1u</td>
</tr>
<tr>
<td>R</td>
<td>1u</td>
</tr>
</tbody>
</table>

3u = 150 – 60
= 90
1u = 90 ÷ 3
= 30
1u + 150 = 30 + 150
= 180
There were 180 blue ribbons at first.

Question 3

At first

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>135</td>
</tr>
<tr>
<td>B</td>
<td></td>
</tr>
</tbody>
</table>

End

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>1u</td>
</tr>
<tr>
<td>B</td>
<td>1u</td>
</tr>
</tbody>
</table>

3u = 240 + 390
= 630
1u = 630 ÷ 3
= 210
F (at first) = 210 + 240 + 135
= 585
B (at first) = 210 + 240
= 450
585 + 450 = 1035
1035 items were on sale at first.

Question 4

At first

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>1u</td>
</tr>
<tr>
<td>C</td>
<td>1u</td>
</tr>
</tbody>
</table>

636

2u = 636 – 116
= 520
1u = 520 ÷ 2
= 260
S (at first) = 260 + 116
= 376
C (at first) = 260

End

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>1u</td>
</tr>
<tr>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>

376 – 226
= 150
C = 150 × 4
= 600
600 – 260 = 340
Andrew bought 340 toy cars.
Answer to Unit 1.1

Question 5
At first
B
50
C

End
4u
B
1u
1u
50
12
C
1u
1u

2u = 50 + 12
= 62
1u = 62 + 2
= 31
2u + 50 = 2 \times 31 + 50
= 112

There were 112 button pins at first.

Question 6
At first
C
1u
1u
1u
1u
43
M
1u
End
C
1u
1u
1u
1u
10
33
M
1u
18
73
3u = 73 + 18 – 10
= 81
1u = 81 + 3
= 27
C (at first) = 4u + 43
= 4 \times 27 + 43
= 151

(a) She baked 151 cupcakes at first.
(b) She baked 27 muffins at first.

Answer to Unit 1.2

Let’s Get Started 1.2

1. Draw your ‘At first’ and ‘End’ models here.

At first
A
55
B

End
80
A
1u
25
55
B
1u
25
55

Answer : 25 + 80 = 105
Bryan has 105 more game cards than Alvin in the end.

2. Draw your ‘At first’ and ‘End’ models here.

At first
C
D
230
End
C
45
D
45
230
45

Answer : 45 + 230 + 45 = 320
Diana had 320 more beads than Catherine in the end.

Ask Yourself
1. Mandy has more money than Kurt. Hence, the bar model representing Mandy is longer than that of Kurt.
2. Mandy gave money to Kurt.
3. The total amount of money they had did not change.

Think Further

At first
M
1p
80
K
1p

End
M
1u
K
1u
1u
1u

4u = 440
1u = 440 + 4
= 110
2p = 440 – 80
= 360
1p = 360 + 2
= 180
M (at first) = 1p + 80 = 180 + 80
= 260
M (gave) = 260 – 110 = 150
Mandy must give $150 to Kurt.

Let’s Practise 1.2

Question 1
At first
A
23
B

Page 2
Answer to Unit 1.2

Question 1 (Cont.)

End

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1u</td>
<td>146</td>
<td>23</td>
</tr>
<tr>
<td>B</td>
<td>1u</td>
<td>146</td>
<td></td>
</tr>
</tbody>
</table>

$3u = 146 + 23 + 146$
$= 315$
$1u = 315 ÷ 3$
$= 105$
$4u - 146 = 4 \times 105 - 146$
$= 274$

Amos had 274 marbles at first.

Question 2

At first

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>204</td>
</tr>
<tr>
<td>Y</td>
<td></td>
</tr>
</tbody>
</table>

End

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>1u</td>
<td>123</td>
</tr>
<tr>
<td>Y</td>
<td>1u</td>
<td>123</td>
</tr>
</tbody>
</table>

$5u = 123 + 204 + 123$
$= 450$
$1u = 450 ÷ 5$
$= 90$
$7u = 7 \times 90$
$= 630$

They had $630 in total at first.

Question 3

At first

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>300</td>
</tr>
</tbody>
</table>

End

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>46</td>
<td>208</td>
</tr>
</tbody>
</table>

$2u = 208$
$1u = 208 ÷ 2$
$= 104$
$4u = 4 \times 104$
$= 416$

There were 416 participants altogether.

Answer to Unit 1.2

Question 4

At first

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$2$</td>
<td>80</td>
</tr>
<tr>
<td>$1$</td>
<td></td>
</tr>
</tbody>
</table>

End

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>$2$</td>
<td>30</td>
<td>35</td>
</tr>
<tr>
<td>$1$</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

$1u = 35$
No. of $2$-notes = $35 \times 2$
$= 70$
No. of $1$-coins = $50 - 15$
$= 35$
Amount of money = $70 \times 2 + 35 \times 1$
$= 175$

There was $175 in the piggy bank at first.

Question 5

At first

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
</tr>
</tbody>
</table>

End

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1u</td>
<td>50</td>
<td>1u</td>
</tr>
<tr>
<td>B</td>
<td>1u</td>
<td>50</td>
<td></td>
</tr>
</tbody>
</table>

$2u = 4 \times 50$
$= 200$
$1u = 200 ÷ 2$
$= 100$
$3u + 150 = 3 \times 100 + 150$
$= 450$

There was 450 ml of water in Tank A.

Question 6

At first

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
</tr>
</tbody>
</table>

End

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1u</td>
<td>30</td>
<td>1u</td>
</tr>
<tr>
<td>B</td>
<td>1u</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

There were 416 participants altogether.
**Answer to Unit 1.2**

**Question 6 (Cont.)**

\[ 3u = 5 \times 30 \]
\[ = 150 \]
\[ 1u = 150 \div 3 \]
\[ = 50 \]
\[ 1u + 30 = 50 + 30 \]
\[ = 80 \]

There were **80 oranges** in Box B at first.

**Answer to Unit 1.3**

**Let’s Get Started 1.3**

3. 

End

\[
\begin{array}{c|c}
E & 1u \\
F & 1u \\
\hline
\end{array}
\]

At first

\[
\begin{array}{c|c|c}
E & 1u & 124 \\
F & 1u & 1u \\
\hline
235 \\
\end{array}
\]

\[ 3u = 235 – 124 \]
\[ = 111 \]
\[ 1u = 111 \div 3 \]
\[ = 37 \]

4. 

At first

\[
\begin{array}{c|c|c}
G & 1u & 10 \\
H & 1u & 10 \\
\hline
2u \\
\end{array}
\]

End

\[
\begin{array}{c|c|c|c}
G & 1u & 10 & 12 \\
H & 1u & 10 & 12 \\
\hline
1u = 10 \\
\end{array}
\]

**Ask Yourself**

1. The keywords in this problem sum are ‘an equal number of stapler bullets left’.

**Think Further**

1. We can solve from the beginning because a comparison between Billy and Anna was provided. It was challenging to solve from the beginning as we do not know where to cut the model for the no. of chicken nuggets eaten by Billy.

**Let’s Practise 1.3**

**Question 1**

At first

\[
\begin{array}{c|c}
W & 1u \\
M & 1u \\
\hline
30 & 30 \\
\end{array}
\]

End

\[
\begin{array}{c|c|c}
W & 1u & 30 \\
M & 1u & 30 \\
\hline
12 \\
\end{array}
\]

\[ 1u = 30 + 12 \]
\[ = 42 \]
\[ 1u + 30 = 42 + 30 \]
\[ = 72 \]

Total = \[ 72 \times 2 \]
\[ = 144 \]

**144 people** were at the opening ceremony at first.

**Question 2**

**Monday**

\[
\begin{array}{c|c}
A & 1u \\
B & 1u \\
\hline
16 & 16 \\
\end{array}
\]

\[ 3u = 16 + 29 \]
\[ = 45 \]

\[ 1u + 16 = 45 + 3 \]
\[ = 15 \]

\[ 1u + 16 = 15 + 16 \]
\[ = 31 \]

Total coins at first = \[ 31 \times 2 \]
\[ = 62 \]

There were **62 coins** in the boxes altogether at first.

**Question 3**

At first

\[
\begin{array}{c|c|c}
A & 1u & 30 \\
B & 1u & 30 \\
\hline
6 & 6 \\
\end{array}
\]

End
Question 3 (Cont.)

3u = 30
1u = 30 ÷ 3
= 10
4u + 6 = 4 × 10 + 6
= 46

There were 46 mattresses in each room.

Question 4
End

C

T

At first

\[
\begin{array}{ccc}
C & 1u & 50 \\
T & 1u & 50 \\
\end{array}
\]

\[
2u = 240 - 4 \times 50
\]

\[
= 40
\]

\[
1u = 40 ÷ 2
\]

\[
= 20
\]

\[
1u + 50 + 20 + 50
\]

\[
= 70
\]

Mrs Chin had 70 cabbages at first.

Question 5
End

K

D

At first

\[
\begin{array}{ccc}
K & 1u & 24 \\
D & 1u & 24 \\
\end{array}
\]

\[
3u = 24 + 60
\]

\[
= 84
\]

\[
1u = 84 ÷ 3
\]

\[
= 28
\]

Dave (end) = 1u + 24

\[
= 28 + 24
\]

\[
= 52
\]

Dave had 52 badges in the end.

Question 6
End

J

K

At first

\[
\begin{array}{ccc}
J & 1u & 64 \\
K & 1u & 64 \\
\end{array}
\]

\[
4u = 64 + 24 + 64
\]

\[
= 152
\]

\[
1u = 152 ÷ 4
\]

\[
= 38
\]

Kennard had 38 keychains at first.

Let’s Get Started 1.4

1. K had 14 marbles left.
M had 90 marbles left.

2. K had 20 marbles left.
M had 112 marbles.

3. K had 2u – 6 of marbles left.
M had 3u of marbles left.

4. K had 2u of marbles left.
M had 3u + 22 of marbles left.

Ask Yourself

1. Two. The relationships in the “At first” and “In the end”.
2. The number of units for the blouses must be the same “At first” and “In the end”.

Let’s Practise 1.4

Question 1

At first

\[
\begin{array}{ccc}
P & & \\
M & & \\
\end{array}
\]

11u = 33

\[
1u = 33 ÷ 11
\]

\[
= 3
\]

9u = 9 × 3

\[
= 27
\]

Henry had 27 more paper clips than fridge magnets.
Answer to Unit 1.4

Question 2
At first
R
C

End
R
C

2u = 20
1u = 20 ÷ 2
= 10
Rulers (sold) = 14u = 14 × 10
= 140
Money received = 140 x $2
= $280
The store received $280 from the sale of the rulers.

Question 3
At first
A
B

End
A
B

4u = 14 + 26
= 40
1u = 40 ÷ 4
= 10
6u = 6 × 10
= 60
There were 60 students altogether in both buses in the end.

Question 4
At first
B
D

End
B
D

5u = 34 + 36
= 70
1u = 70 ÷ 5
= 14

Dylan had 48 cards.

Question 5
At first
P
C

End
P
C

2u = 38
1u = 38 ÷ 2
= 19
3u = 3 × 19
= 57
Celine had 57 buttons.

Question 6
At first
P
T

End
P
T

1u = 30
1u + 270 = 30 + 270
= 300
Percy brought $300 shopping.

Answer to Unit 1.5

Let's Get Started 1.5
The table can be completed using any acceptable answers given. Ensure that same student and teacher are being used across all the years indicated in the table. You will realize the age difference between the student and the teacher remains the same throughout.

Ask Yourself
1. The difference in age between any two people will always remain the same.

Think Further
1. When equal parts are added to the model, in this instance 8 years, we draw the equal parts to the left of the model to show clearly the difference did not change (as can be seen on the right side of the model).
### Answer to Unit 1.5

#### Let's Practise 1.5

**Question 1**

<table>
<thead>
<tr>
<th>Now</th>
<th>In 6 years’ time</th>
</tr>
</thead>
<tbody>
<tr>
<td>J</td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
</tr>
</tbody>
</table>

\[
\begin{align*}
2u &= 64 - 28 - 6 - 6 \\
1u &= 24 + 2 \\
\text{Josh’s age in 9 years’ time} &= 12 + 9 \\
\text{Josh will be 21 years old in 9 years’ time.}
\end{align*}
\]

**Question 2**

<table>
<thead>
<tr>
<th>Present (Now)</th>
<th>Future (? years time)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M = 24</td>
<td>M = 3u</td>
</tr>
<tr>
<td>S = 2</td>
<td>S = 1u</td>
</tr>
<tr>
<td>Difference = 24 – 2</td>
<td>Difference = 3u – 1u</td>
</tr>
</tbody>
</table>

\[
\begin{align*}
2u &= 22 \\
1u &= 22 + 2 \\
\text{No. of years later} &= 11 - 2 \\
\text{In 9 years’ time, Mary would be thrice her younger sister’s age.}
\end{align*}
\]

**Question 3**

<table>
<thead>
<tr>
<th>6 years’ ago</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>K = 3u</td>
<td>S = 1u</td>
</tr>
<tr>
<td>Difference = 2u</td>
<td></td>
</tr>
</tbody>
</table>

\[
\begin{align*}
2u &= 24 \\
1u &= 24 + 2 \\
\text{In 10 years’ time} &= 3 \times 12 + 10 + 6 \\
\text{Mrs Kumar will be 52 years old in 10 years’ time.}
\end{align*}
\]

**Question 4**

<table>
<thead>
<tr>
<th>At first</th>
<th>End (left)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shirts = 1210</td>
<td>Shirts = 1u</td>
</tr>
<tr>
<td>Shorts = 1910</td>
<td>Shorts = 15u</td>
</tr>
<tr>
<td>Difference = 700</td>
<td>Difference = 14u</td>
</tr>
</tbody>
</table>

\[
\begin{align*}
14u &= 700 \\
1u &= 700 ÷ 14 \\
&= 50 \\
\text{Shirts sold} &= 1210 - 50 \\
&= 1160 \\
\text{Total sold} &= 1160 \times 2 \\
&= 2320 \\
\text{2320 shirts and pairs of shorts were sold altogether.}
\end{align*}
\]

**Question 5**

<table>
<thead>
<tr>
<th>At first</th>
<th>End (left)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P = 1u</td>
<td>P = 72 ÷ 6</td>
</tr>
<tr>
<td>R = 5u</td>
<td>R = 72</td>
</tr>
<tr>
<td>Difference = 4u</td>
<td>Difference = 60</td>
</tr>
</tbody>
</table>

\[
\begin{align*}
4u &= 60 \\
1u &= 60 ÷ 4 \\
&= 15 \\
\text{Pens sold} &= 15 - 12 \\
&= 3 \\
\text{Amount of money received} &= (3 \times $2) + (3 \times $1) \\
&= $9 \\
\text{Mr Kim received $9 from the sale of the two items.}
\end{align*}
\]

**Question 6**

<table>
<thead>
<tr>
<th>At first</th>
<th>End (left)</th>
</tr>
</thead>
<tbody>
<tr>
<td>J = 200</td>
<td>J = 1u</td>
</tr>
<tr>
<td>H = 840</td>
<td>H = 3u</td>
</tr>
<tr>
<td>Difference = 640</td>
<td>Difference = 2u</td>
</tr>
</tbody>
</table>

\[
\begin{align*}
2u &= 640 \\
1u &= 640 ÷ 2 \\
&= 320 \\
\text{(a) Each boy received} &= 320 - 200 \\
&= 120 \\
\text{Ian gave} \text{ 120 marbles} \text{ to each boy.} \\
\text{Both boys (received)} &= 2 \times 120 \\
&= 240 \\
300 - 240 &= 60 \\
\text{(b) Ian was left with} \text{ 60 marbles.}
\end{align*}
\]

### Answer to Unit 1.6

#### Let’s Get Started 1.6

1.

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
</table>

(Ben is repeated)
Answer to Unit 1.6

2.

<table>
<thead>
<tr>
<th></th>
<th>1u</th>
<th>33</th>
<th>57</th>
</tr>
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<tbody>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>1u</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>1u</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Kenny is repeated)

3.

<table>
<thead>
<tr>
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<th>1u</th>
<th>1u</th>
<th>1u</th>
<th>21</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>1u</td>
<td>1u</td>
<td>1u</td>
<td></td>
</tr>
</tbody>
</table>

4.

<table>
<thead>
<tr>
<th></th>
<th>1u</th>
<th>1u</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W</td>
<td>1u</td>
<td></td>
</tr>
</tbody>
</table>

(Female is repeated)

4.

A = 2u³ (16u)
B + C + D = 1u⁴ (8u)

B = 3u² (6u)
C + D = 1u² (2u)
B + C + D = 4u³ (8u)

C = 1u
D = 1u
C + D = 2u

(Ben, Cecil and Dan are repeated)

Ask Yourself
1. The number of children is being repeated as boys and girls.
2. It is repeated as a group (boys and girls).

Think Further

<table>
<thead>
<tr>
<th></th>
<th>1u</th>
<th>1u</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>1u</td>
<td></td>
</tr>
</tbody>
</table>

6u = 220 + 200
= 420
1u = 420 ÷ 6
= 70
3u – 200 = 3 × 70 – 200
= 210 – 200
= 10

There were 10 adults at the event.

Let’s Practise 1.6

Question 1

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>F</td>
<td>G</td>
</tr>
<tr>
<td>M</td>
<td>W</td>
</tr>
</tbody>
</table>

300

Answer to Unit 1.6

Question 1 (Cont.)

10u = 300 – 50
= 250
1u = 250 ÷ 10
= 25
4u + 50 = 4 × 25 + 50
= 150

There were 150 more male guests than girls.

Question 2

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A+B</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
</tr>
</tbody>
</table>

Unitary approach

C = 1u³ (3u)
A + B = 4u³ (12u)
A = 1u⁴ (4u)
B = 2u⁴ (8u)
A + B = 3u⁴ (12u)

4u = 80
1u = 80 ÷ 4
= 20
15u = 15 × 20
= 300

The three girls had $300 altogether.

Question 3

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>1u</td>
</tr>
<tr>
<td>T</td>
<td>1u</td>
</tr>
<tr>
<td>W</td>
<td>1u</td>
</tr>
<tr>
<td>Th</td>
<td>1u</td>
</tr>
</tbody>
</table>

2u = 103 – 11 × 3
= 70
1u = 70 ÷ 2
= 35
5u = 5 × 35
= 175

175 cups were sold on Thursday

Question 4

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>C</td>
<td></td>
</tr>
</tbody>
</table>

274

354

482
### Answer to Unit 1.6

#### Question 4 (Cont.)

C = 482 – 274

= 208

B = 354 – 208

= 146

Bonita sold **146** funfair tickets.

#### Question 5

At first

<table>
<thead>
<tr>
<th></th>
<th>K</th>
<th>P</th>
<th>R</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1u</td>
<td>1u</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>1</td>
<td>1u</td>
<td>1u</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

In the end

<table>
<thead>
<tr>
<th></th>
<th>K</th>
<th>P</th>
<th>R</th>
<th>Z</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1u</td>
<td>1u</td>
<td>12</td>
<td>12</td>
</tr>
</tbody>
</table>

12 + 12 + 32 + 14 = 70

1u = 124 – 70

= 54

Total of P, K, R = 6u + 80

6u + 80 = 6 × 54 + 80

= 404

Kenny, Penny and Ryan had **$404** altogether.

#### Question 6

<table>
<thead>
<tr>
<th></th>
<th>C</th>
<th>B</th>
<th>A</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1u</td>
<td>1u</td>
<td>1u</td>
<td>1u</td>
</tr>
<tr>
<td>1</td>
<td>1u</td>
<td>1u</td>
<td>2400</td>
<td>3400</td>
</tr>
</tbody>
</table>

2400 + 2400 + 3400 = 8200

10u = 27 800 – 8200

= 19 600

1u = 19 600 ÷ 10

= 1960

3u + 2400 = 3 × 1960 + 2400

= 8280

Brandon had **8280 reward points**.

### Answer to Unit 1.7

#### Let's Get Started 1.7

<table>
<thead>
<tr>
<th>Denomination of notes</th>
<th>Quantity of notes</th>
<th>×</th>
<th>Value ($)</th>
<th>=</th>
<th>Total Value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1</td>
<td>1</td>
<td>x</td>
<td>1</td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>$2</td>
<td>6</td>
<td>x</td>
<td>2</td>
<td></td>
<td>12</td>
</tr>
<tr>
<td>$5</td>
<td>2</td>
<td>x</td>
<td>5</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>$10</td>
<td>11</td>
<td>x</td>
<td>10</td>
<td></td>
<td>110</td>
</tr>
</tbody>
</table>

| Total                | 22                |   |         | = | 135            |

#### Ask Yourself

1. The ‘quantity’ is represented by the number of birds and hamsters at the pet store. The ‘value’ is represented by the number of legs of each animal at the pet store.

#### Let's Practise 1.7

#### Question 1

<table>
<thead>
<tr>
<th></th>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items (Cents)</th>
<th>Total value (Cents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>3u</td>
<td>x</td>
<td>20</td>
<td>60u</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1u</td>
<td>x</td>
<td>50</td>
<td>50u</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4u</td>
<td></td>
<td></td>
<td>110u</td>
<td></td>
</tr>
</tbody>
</table>

110u = 6600

1u = 6600 ÷ 110

= 60

3u = 3 × 60

= 180

Joseph has **180 20-cent coins**.

#### Question 2

<table>
<thead>
<tr>
<th></th>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total Value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>3u</td>
<td>x</td>
<td>150</td>
<td>450u</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>1u</td>
<td>x</td>
<td>50</td>
<td>50u</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>4u</td>
<td></td>
<td></td>
<td>500u</td>
<td></td>
</tr>
</tbody>
</table>

Difference = 450u – 50u

= 400u

400u = 1200

1u = 1200 ÷ 400

= 3

4u = 4 × 3

= 12

12 people will be receiving the red packets.
Answer to Unit 1.7

Question 3

1 pair of sport shoes = 2 \times 23
= 46

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>\times</th>
<th>Value of items ($)</th>
<th>Total Value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sa</td>
<td>1u</td>
<td></td>
<td>23</td>
<td>23u</td>
</tr>
<tr>
<td>Sl</td>
<td>3u</td>
<td></td>
<td>16</td>
<td>48u</td>
</tr>
<tr>
<td>Sp</td>
<td>1u</td>
<td></td>
<td>46</td>
<td>46u</td>
</tr>
<tr>
<td>Total</td>
<td>5u</td>
<td></td>
<td></td>
<td>117u</td>
</tr>
</tbody>
</table>

117u = 468
1u = 468 \div 117 = 4
48u = 23u = 25u
25u = 25 \times 4 = 100

Wayne spent $100 more on the pairs of slippers than on pairs of the sandals.

Question 4

NP = 4u
P = 1u
OM = 1u^2 (2u)
NP = 2u^2 (4u)

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>\times</th>
<th>Value of items (Coupons)</th>
<th>Unit Value (Coupons)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-participants</td>
<td>4u</td>
<td>\times</td>
<td>3</td>
<td>12u</td>
</tr>
<tr>
<td>Participants</td>
<td>1u</td>
<td>\times</td>
<td>8</td>
<td>8u</td>
</tr>
<tr>
<td>Organising members</td>
<td>2u</td>
<td>\times</td>
<td>12</td>
<td>24u</td>
</tr>
<tr>
<td>Total</td>
<td>7u</td>
<td></td>
<td></td>
<td>44u</td>
</tr>
</tbody>
</table>

24u – 8u = 16u
16u = 144
1u = 144 \div 16
= 9
7u = 7 \times 9
= 63

There were 63 people at the swimming meet.

Question 5

7 – 12 years old = 3u
13 – 16 years old = 1u
1 – 6 years old = 2u^2 (6u)
7 – 12 years old = 1u^2 (3u)

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>\times</th>
<th>Value of items ($)</th>
<th>Unit Value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-6 years old</td>
<td>6u</td>
<td>\times</td>
<td>3</td>
<td>18u</td>
</tr>
<tr>
<td>7-12 years old</td>
<td>3u</td>
<td>\times</td>
<td>6</td>
<td>18u</td>
</tr>
<tr>
<td>13-16 years old</td>
<td>1u</td>
<td>\times</td>
<td>12</td>
<td>12u</td>
</tr>
<tr>
<td>Total</td>
<td>10u</td>
<td></td>
<td></td>
<td>48u</td>
</tr>
</tbody>
</table>

48u = 1440
1u = 1440 \div 48
= 30
18u = 18 \times 30
= 540

$540 was collected from the age category of 1 to 6 years old.

Question 6

C = 5u
A = 1u
B = 3u
G = 2u
C = 3u + 2u
= 5u

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>\times</th>
<th>Value of items ($)</th>
<th>Unit Value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults</td>
<td>1u</td>
<td>\times</td>
<td>2</td>
<td>2u</td>
</tr>
<tr>
<td>Boys</td>
<td>3u</td>
<td>\times</td>
<td>1</td>
<td>3u</td>
</tr>
<tr>
<td>Girls</td>
<td>2u</td>
<td>\times</td>
<td>1</td>
<td>2u</td>
</tr>
<tr>
<td>Total</td>
<td>6u</td>
<td></td>
<td></td>
<td>7u</td>
</tr>
</tbody>
</table>

7u = 1470
1u = 1470 \div 7
= 210
5u = 5 \times 210
= 1050

1050 children were at the event.
Answer to Unit 2.1

Let's Get Started 2.1

<table>
<thead>
<tr>
<th>S/N</th>
<th>Branch Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Total pages</td>
</tr>
<tr>
<td></td>
<td>3u² (6u)</td>
</tr>
<tr>
<td></td>
<td>1u² (2u)</td>
</tr>
<tr>
<td></td>
<td>1st day</td>
</tr>
<tr>
<td></td>
<td>Remainder</td>
</tr>
<tr>
<td>2u</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2nd day</td>
</tr>
<tr>
<td></td>
<td>Left</td>
</tr>
<tr>
<td>1u</td>
<td>3 = 90</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>S/N</th>
<th>Branch Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.</td>
<td>5u² (15u)</td>
</tr>
<tr>
<td></td>
<td>Total fishes</td>
</tr>
<tr>
<td></td>
<td>3u² (9u)</td>
</tr>
<tr>
<td></td>
<td>Guppies</td>
</tr>
<tr>
<td></td>
<td>2u² (6u)</td>
</tr>
<tr>
<td></td>
<td>Remainder</td>
</tr>
<tr>
<td>3u</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1st day</td>
</tr>
<tr>
<td></td>
<td>Tetras</td>
</tr>
<tr>
<td>1u</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2nd day</td>
</tr>
<tr>
<td></td>
<td>Left</td>
</tr>
<tr>
<td>2u</td>
<td>4 = 16</td>
</tr>
</tbody>
</table>

Think Further

1. 5u - 2u = 3u
   3u = 72
   1u = 72 ÷ 3
   = 24
   15u = 15 × 24
   = 360
   Anthony had $360 at first.

2. Money on food and shoes = \(\frac{1}{3} + \frac{1}{5} = \frac{5}{15} + \frac{3}{15} = \frac{8}{15}\)

   Money left = 1 - \(\frac{8}{15}\) = \(\frac{7}{15}\)

   \(\frac{7}{15}\) of total = 70

   \(\frac{1}{5}\) of total = 10

   \(\frac{1}{15}\) of total = 10 × 15
   = 150

   Anthony had $150 at first.

Let's Practise 2.1

Question 1

Total money
10u

W  Remainder
3u  7u

D  Left
3u  4u

Question 2

5u Total money

W  Remainder
1u  4u

2u² (4u) TV

1u  Left
2u² (2u) 2u² (2u)

(a) Fraction spent on TV set = \(\frac{2}{5}\)

   Caleb spent \(\frac{2}{5}\) his money on the television set.

(b) 2u = 1440
   1u = 1440 ÷ 2
   = 720

   The watch cost $720.

Question 3

Total money
40u

D  P  Remainder
8u  25u  7u

C  Left
4u  3u

3u = 183
1u = 183 ÷ 3
   = 61
25u = 25 × 61
   = 1525

Rebecca spent $1525 on the purse.

Answer to Unit 2.1 (Cont.)

Question 1

(a) Fraction spent on dress = \(\frac{3}{10}\)

   Felicity spent \(\frac{3}{10}\) of her money on the dress.

(b) 4u = 400
   1u = 400 ÷ 4
   = 100
   10u = 10 × 100
   = 1000

   Felicity had $1000 at first.

Question 2

5u Total money

W  Remainder
1u  4u

2u² (4u) TV

1u  Left
2u² (2u) 2u² (2u)

(a) Fraction spent on TV set = \(\frac{2}{5}\)

   Caleb spent \(\frac{2}{5}\) his money on the television set.

(b) 2u = 1440
   1u = 1440 ÷ 2
   = 720

   The watch cost $720.

Question 3

Total money
40u

D  P  Remainder
8u  25u  7u

C  Left
4u  3u

3u = 183
1u = 183 ÷ 3
   = 61
25u = 25 × 61
   = 1525

Rebecca spent $1525 on the purse.
Answer to Unit 2.1

Question 4

Total stamps

\[ 35u \]

\[
\begin{array}{c}
10u \\
7u \\
18u \\
\end{array}
\]

\[ \begin{array}{c}
B \\
F \\
\text{Remainder} \\
\end{array} \]

\[ 3u^{10} (18u) \]

\[ \begin{array}{c}
D \\
1u^{6} (6u) \\
2u^{6} (12u) \\
\end{array} \]

\[ 12u = 36 \]

\[ 1u = 36 \div 12 \]

\[ = 3 \]

\[ 35u = 35 \times 3 \]

\[ = 105 \]

Mabel had 105 stamps at first.

Question 5

Total donations

\[ 9u^{4} (36u) \]

\[ \begin{array}{c}
4u^{4} (16u) \\
5u^{4} (20u) \\
\end{array} \]

\[ \begin{array}{c}
P \\\n\text{Remainder} \\
\end{array} \]

\[ 4u^{5} (20u) \]

\[ \begin{array}{c}
S \\
C \\
\end{array} \]

\[ \begin{array}{c}
1u^{5} (5u) \\
3u^{5} (15u) \\
\end{array} \]

\[ 15u = 240 000 \]

\[ 1u = 240 000 \div 15 \]

\[ = 16 000 \]

\[ 36u = 36 \times 16 000 \]

\[ = 576 000 \]

$576 000 was raised during the event.

Question 6

Total cupcakes

\[ 3u^{2} (6u) \]

\[ \begin{array}{c}
S \\
\text{Remainder} \\
\end{array} \]

\[ \begin{array}{c}
1u^{2} (2u) \\
2u^{2} (4u) \\
\end{array} \]

\[ \begin{array}{c}
A \\
\text{Left} \\
\end{array} \]

\[ \begin{array}{c}
1u \\
3u \\
\end{array} \]

(a) Fraction to orphanage = \[ \frac{3}{6} \]

\[ = \frac{1}{2} \]

(b) \[ 3u = 285 \]

\[ 1u = 285 \div 3 \]

\[ = 95 \]

\[ 2u = 2 \times 95 \]

\[ = 190 \]

190 cupcakes were for Sally’s birthday party.

Answer to Unit 2.2

Let’s Get Started 2.2

<table>
<thead>
<tr>
<th>S/N</th>
<th>Branch Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>Total monthly savings</td>
</tr>
<tr>
<td></td>
<td>Bag</td>
</tr>
<tr>
<td></td>
<td>$60</td>
</tr>
<tr>
<td></td>
<td>Basketball</td>
</tr>
<tr>
<td></td>
<td>2u</td>
</tr>
</tbody>
</table>

Working backwards:

\[ \frac{1}{4} \text{ of total} = 1u \]

\[ \frac{1}{4} \text{ of total} = 4u \]

\[ \text{Bag} = 4u - 3u \]

\[ = 1u \]

3.  | Total participants |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>330</td>
</tr>
<tr>
<td></td>
<td>G</td>
</tr>
<tr>
<td></td>
<td>1u</td>
</tr>
</tbody>
</table>

Working backwards:

\[ \frac{1}{5} \text{ of total} = 3u \]

\[ \frac{1}{5} \text{ of total} = 15u \]

\[ \text{Adults} = 15u - 4u \]

\[ = 11u \]

Ask Yourself

1. A value is given at the beginning for one of the branch. This makes it different from that in the previous units where all the fractions representing each branch are given as part of the information in the question.

Think Further

\[ \frac{1}{3} \text{ of money} = 3u \]

\[ \frac{2}{3} \text{ of money} = 9u \]

Money spent on plates = \[ 9u - 5u \]

\[ = 4u \]

\[ 3S = 1P \]

\[ 12S = 4P \]

2u of money = \[ 4P \]

4u of money = \[ 8P \]

\[ 8P = 156 \]

\[ 1P = 156 \div 8 \]

\[ = 19.50 \]

Each plate cost $19.50.
Let’s Practise 2.2

Question 1

Total stickers

\[
\begin{align*}
\text{B} & \quad \text{Remainder} \\
111 & \quad 8u \\
\end{align*}
\]

\[
\begin{align*}
\frac{1}{9} \text{ of stickers} &= 5u \\
\frac{9}{9} \text{ of stickers} &= 9 \times 5u \\
&= 45u \\
B &= 45u - 8u \\
&= 37u \\
37u &= 111 \\
1u &= 111 \div 37 \\
&= 3 \\
45u &= 45 \times 3 \\
&= 135 \\
\text{Ken had 135 stickers at first.}
\end{align*}
\]

Question 2

Total money

\[
\begin{align*}
\text{E} & \quad \text{Remainder} \\
$18 & \quad 12u \\
\end{align*}
\]

\[
\begin{align*}
\frac{1}{3} \text{ of total} &= 5u \\
\frac{3}{3} \text{ of total} &= 3 \times 5 \\
&= 15u \\
E &= 15u - 12u \\
&= 3u \\
3u &= 18 \\
1u &= 18 \div 3 \\
&= 6 \\
7u &= 7 \times 6 \\
&= 42 \\
\text{Jack’s mother spent $42 on the Chinese story books.}
\end{align*}
\]

Question 3

Total fruits

\[
\begin{align*}
\text{M} & \quad \text{Remainder} \\
280 & \quad 5u \\
\end{align*}
\]

\[
\begin{align*}
\frac{1}{5} \text{ of total} &= 8u \\
\frac{3}{5} \text{ of total} &= 3 \times 5u \\
&= 15u \\
B &= 15u - 14u \\
&= 1u \\
7u &= 28 \\
1u &= 28 \div 7 \\
&= 4 \\
6u &= 6 \times 4 \\
&= 24 \\
\text{Jazreel was left with $24 in the end.}
\end{align*}
\]

Answer to Unit 2.2 (Cont.)

Question 4

Total money

\[
\begin{align*}
\text{B} & \quad \text{Remainder} \\
7u^2 (14u) & \quad 12u \\
\end{align*}
\]

\[
\begin{align*}
\frac{2}{5} \text{ of total} &= 3u^2 (6u) \\
\frac{1}{5} \text{ of total} &= 6u + 2 \\
&= 3u \\
\frac{5}{5} \text{ of total} &= 5 \times 3u \\
&= 15u \\
B &= 15u - 14u \\
&= 1u \\
\text{Difference between crayons and books} &= 8u - 1u \\
&= 7u \\
7u &= 28 \\
1u &= 28 \div 7 \\
&= 4 \\
6u &= 6 \times 4 \\
&= 24 \\
\text{Jazreel was left with $24 in the end.}
\end{align*}
\]

Question 5

Total beads

\[
\begin{align*}
\text{B} & \quad \text{Remainder} \\
5u^3 (20u) & \quad 12u \\
\end{align*}
\]

\[
\begin{align*}
\frac{1}{5} \text{ of total} &= 8u \\
\frac{3}{5} \text{ of total} &= 3u^3 (12u) \\
&= 24 \\
\text{Jazreel was left with $24 in the end.}
\end{align*}
\]
Answer to Unit 2.2

Question 5 (Cont.)

\[ \frac{4}{9} \text{ of total} = 3u + (12u) \]
\[ \frac{1}{9} \text{ of total} = 12u + 4 \]
\[ = 3u \]
\[ \frac{9}{9} \text{ of total} = 9 \times 3u \]
\[ = 27u \]
\[ B = 27u - 20u \]
\[ = 7u \]
\[ B + \text{left} = 7u + 12u \]
\[ = 19u \]
\[ 19u = 209 \]
\[ 1u = 209 \div 19 \]
\[ = 11 \]
\[ 27u = 27 \times 11 \]
\[ = 297 \]

Caitlin had 297 beads at first.

Question 6

Total point

<table>
<thead>
<tr>
<th>S</th>
<th>Remainder</th>
</tr>
</thead>
<tbody>
<tr>
<td>220 ml</td>
<td>5u</td>
</tr>
</tbody>
</table>

\[ \frac{2}{3} \text{ of total} = 4u + 80 \]
\[ \frac{1}{3} \text{ of total} = 2u + 40 \]
\[ \frac{3}{3} \text{ of total} = 6u + 120 \]
\[ S = 1u + 120 \]
\[ 1u = 220 - 120 \]
\[ = 100 \]
\[ 6u + 120 = 6 \times 100 + 120 \]
\[ = 720 \]

Darren had 720 ml of paint at first.

Answer to Unit 2.3

Let’s Get Started 2.3

<table>
<thead>
<tr>
<th>S/N</th>
<th>Branch Diagram</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Total jelly beans</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>S</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{4} T + 7)</td>
</tr>
<tr>
<td></td>
<td>Cot</td>
</tr>
<tr>
<td></td>
<td>(\frac{1}{3} R - 2)</td>
</tr>
</tbody>
</table>

Let’s Practise 2.3

Question 1

Total amount of money (T)

<table>
<thead>
<tr>
<th>AM</th>
<th>( \frac{5}{6} T )</th>
<th>Remainder(R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \frac{1}{6} T + 6 )</td>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

\[ \frac{7}{8} \text{ of remainder} = 8 + 13 \]
\[ = 21 \]
\[ \frac{1}{8} \text{ of remainder} = 21 + 7 \]
\[ = 3 \]
\[ \frac{8}{8} \text{ of remainder} = 8 \times 3 \]
\[ = 24 \]
\[ \frac{5}{6} \text{ of total} = 6 + 24 \]
\[ = 30 \]
\[ \frac{1}{6} \text{ of total} = 30 \div 5 \]
\[ = 6 \]

Art materials = \( \frac{1}{6} T + 6 = 6 + 6 \)
\[ = 12 \]

The art materials cost $12.
Answer to Unit 2.3
Question 2

Total no. of beads (T)

\[
\begin{align*}
\frac{4}{9}T + 15 & = 45 \\
\ N & = \frac{3}{5}R \\
\end{align*}
\]

Remainder (R)

\[
\begin{align*}
\frac{3}{5} \text{ of remainder} & = 13 + 14 \\
& = 27 \\
\frac{1}{5} \text{ of remainder} & = 27 + 3 \\
& = 9 \\
\frac{5}{8} \text{ of remainder} & = 9 \times 5 \\
& = 45 \\
\frac{5}{9} \text{ of total} & = 45 + 15 \\
& = 60 \\
\frac{1}{9} \text{ of total} & = 60 \div 5 \\
& = 12 \\
B & = \frac{4}{9} \text{ of total} + 15 \\
& = 12 \times 4 + 15 \\
& = 63 \\
N & = 45 - 14 = 31 \\
\text{Total beads used} & = 63 + 31 \\
& = 94
\end{align*}
\]

Jane used 94 beads for the bracelet and necklace.

Question 3

Total no. of points (T)

\[
\begin{align*}
\frac{4}{9}T - 200 & = 1100 \\
\ M & = \frac{10}{11}R \\
\end{align*}
\]

Remainder (R)

\[
\begin{align*}
\frac{10}{11} \text{ of remainder} & = 1013 - 13 \\
& = 1000 \\
\frac{1}{11} \text{ of remainder} & = 1000 \div 10 \\
& = 100 \\
\frac{11}{11} \text{ of remainder} & = 11 \times 100 \\
& = 1100 \\
\frac{5}{9} \text{ of total} & = 1100 - 200 \\
& = 900
\end{align*}
\]

Question 3 (Cont.)

\[
\begin{align*}
\frac{1}{9} \text{ of total} & = 900 \div 5 \\
& = 180 \\
\frac{9}{9} \text{ of total} & = 9 \times 180 \\
& = 1620
\end{align*}
\]

Mr Davley had 1620 membership points before the redemption.

Question 4

Total amount of money (T)

\[
\begin{align*}
\frac{3}{5}T + 16 & = 48 \\
\ L & = \frac{3}{4}R \\
\end{align*}
\]

Remainder (R)

\[
\begin{align*}
\frac{3}{4} \text{ of remainder} & = 38 - 2 \\
& = 36 \\
\frac{1}{4} \text{ of remainder} & = 36 \div 3 \\
& = 12 \\
\frac{4}{4} \text{ of remainder} & = 4 \times 12 \\
& = 48 \\
\frac{2}{5} \text{ of total} & = 48 + 16 = 64 \\
\frac{1}{5} \text{ of total} & = 64 \div 2 \\
& = 32 \\
C & = \frac{3}{5} \text{ of total} + 16 \\
& = 3 \times 32 + 16 \\
& = 112 \\
L & = 48 - 38 \\
& = 10 \\
\text{Difference} & = 112 - 10 \\
& = 102
\end{align*}
\]

Doreen spent $102 more on cosmetic products than on her lunch.

Question 5

Total no. of problem sums (T)

\[
\begin{align*}
\frac{5}{9}T & = 22 \\
\end{align*}
\]

Remainder (R)

\[
\begin{align*}
\frac{5}{9} \text{ of total} & = 1100 - 200 \\
& = 900 \\
\frac{1}{9} \text{ of total} & = 900 \div 10 \\
& = 100 \\
\frac{11}{11} \text{ of remainder} & = 11 \times 100 \\
& = 1100 \\
\frac{2}{5} \text{ of total} & = 45 + 15 \\
& = 60 \\
\frac{1}{9} \text{ of total} & = 60 \div 5 \\
& = 12 \\
B & = \frac{4}{9} \text{ of total} + 15 \\
& = 12 \times 4 + 15 \\
& = 63 \\
N & = 45 - 14 = 31 \\
\text{Total beads used} & = 63 + 31 \\
& = 94
\end{align*}
\]
Answer to Unit 2.3

Question 5 (Cont.)

\[
\frac{7}{11} \text{ of remainder } = 29 - 15 = 14
\]

\[
\frac{1}{11} \text{ of remainder } = 14 + 7 = 2
\]

\[
\frac{11}{11} \text{ of remainder } = 11 \times 2 = 22
\]

\[
\frac{4}{9} \text{ of total } = 22 + 2 = 24
\]

\[
\frac{1}{9} \text{ of total } = 24 + 4 = 6
\]

\[
\frac{9}{9} \text{ of total } = 9 \times 6 = 54
\]

Mike was given **54 questions** at first.

---

### Question 6

The shaded part is the overlapping part between the two figures. Hence, it is the repeated item.

---

**Ask Yourself**

The shaded part is the overlapping part between the two figures. Hence, it is the repeated item.

---

**Think Further**

1. \[
X + Y = 1u \times 7 (7u) \]
2. \[
Y + Z = 2u \times 7 (14u) \]
3. \[
Y = 2u \times 4 (8u) \]
4. \[
Y + Z = 7u \times 7 (49u) \]

Summary:

- \[
X : 7u - 4u = 3u
\]
- \[
Y : 4u
\]
- \[
Z : 14u - 4u = 10u
\]
- \[
\text{Total} = 3u + 4u + 10u = 17u
\]

Fraction of the figure that is shaded = \[\frac{4}{17}\]

---
Answer to Unit 2.4

Let’s Practise 2.4

Question 1

\[
\begin{align*}
A + B &= 3u^2 (15u) \\
C + B &= 4u^2 (20u)
\end{align*}
\]

Summary

\[
\begin{align*}
A &= 3u \\
B &= 12u \\
C &= 8u \\
B + C &= 5u^2 (20u)
\end{align*}
\]

Fraction of figure shaded \(\frac{12}{23}\)

Question 2

\[
\begin{align*}
A + B &= 3u^3 (9u) \\
C + B &= 7u^3 (21u)
\end{align*}
\]

Summary

\[
\begin{align*}
A &= 2u \\
B &= 7u \\
C &= 14u \\
B + C &= 3u^3 (21u)
\end{align*}
\]

Shaded part, B = 7u = 42

1u = 42 ÷ 7

= 6

Difference in area between the four-sided figure (A+B) and the oval (B+C) = 21u – 9u

= 12u

12u = 12 \times 6

= 72

The difference in the area is 72 cm².

Question 3

\[
\begin{align*}
J &= 2u \\
K &= 1u \\
J &= 1u^2 (2u) \\
D &= 3u^2 (6u)
\end{align*}
\]

Summary

\[
\begin{align*}
J &= 2u \\
D &= 6u \\
K &= 1u \\
7u &= 21
\end{align*}
\]

1u = 21 ÷ 7

= 3

2u = 2 \times 3

= 6

Jason had 6 cousins.

Question 4

\[
\begin{align*}
T &= 2u^4 (8u) \\
Sh &= 9u^4 (36u) \\
So &= 3u^3 (27u) \\
Sh &= 4u^3 (36u)
\end{align*}
\]

Summary

\[
\begin{align*}
T &= 8u \\
Sh &= 36u \\
So &= 27u
\end{align*}
\]

Difference between socks and trousers = 27u – 8u

= 19u

19u = 38

1u = 38 ÷ 19

= 2

71u = 71 \times 2

= 142

Mr Osman bought 142 trousers, shirts and pairs of socks.

Question 5

\[
\begin{align*}
$50 &= 3u^3 (9u) \\
$10 &= 4u^3 (12u) \\
$10 +$50 &= 7u^3 (21u) \\
$10 +$50 &= 3u^3 (21u) \\
$2 &= 1u^2 (7u)
\end{align*}
\]

Summary

\[
\begin{align*}
$50 &= 9u \\
$10 &= 12u \\
$2 &= 7u
\end{align*}
\]

12u – 7u = 5u

5u = 15

1u = 15 ÷ 5

= 3

Number of $50-notes = 9u = 9 \times 3

= 27

Total value of $50-notes = 27 \times 50

= 1350

Number of $10-notes = 12u

= 12 \times 3

= 36

Total value of $10-notes = 36 \times 10

= 360

Number of $2-notes = 7u

= 7 \times 3

= 21

Total value of $2-notes = 21 \times 2

= 42

Money in the end = 1350 + 360 + 42

= 1752

There was $1752 in the safe deposit box.
Answer to Unit 2.4

Question 6

A = 1u × 3
B + C + D = 8u × 3
B = 1u × 6
C + D = 3u × 18
B + C + D = 4u × 24
C = 5u × 10
D = 4u × 8
C + D = 9u × 18

Summary
A = 3u
B = 6u
C = 10u
D = 8u
Total = 3u + 6u + 10u + 8u = 27u

Answer to Unit 2.5

Let’s Get Started 2.5

<table>
<thead>
<tr>
<th>At first</th>
<th>What has happened?</th>
<th>End (As a result)</th>
<th>What remained unchanged?</th>
<th>Find the value of 1 unit.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.</td>
<td>A has $\frac{2}{3}$ as many marbles as B</td>
<td>A loses 40 marbles</td>
<td>B has 4 times as many marbles as A</td>
<td>.diff = 8u - 3u = 5u</td>
</tr>
<tr>
<td></td>
<td>A = 2u × 3 (8u)</td>
<td>B = 4u × 3 (12u)</td>
<td>The number of marbles that B has.</td>
<td>5u = 40</td>
</tr>
<tr>
<td></td>
<td>B = 3u × 4 (12u)</td>
<td></td>
<td></td>
<td>1u = 8</td>
</tr>
<tr>
<td>3.</td>
<td>$\frac{2}{3}$ of the fruits at a stall are apples (A) and oranges (O). The rest were pears.</td>
<td>25 pears are added to the stall</td>
<td>$\frac{7}{10}$ of the fruits are pears. The rest are apples and oranges.</td>
<td>Diff = 14u - 9u = 5u</td>
</tr>
<tr>
<td></td>
<td>A + O = 2u × 3 (6u)</td>
<td>A + O = 3u × 3 (9u)</td>
<td>The number of apples and oranges.</td>
<td>5u = 25</td>
</tr>
<tr>
<td></td>
<td>P = 3u × 3 (9u)</td>
<td>P = 7u × 4 (28u)</td>
<td></td>
<td>1u = 5</td>
</tr>
</tbody>
</table>

Let’s Practise 2.5

Question 1

At first
P = 1u × 4 (4u)
M = 3u × 4 (12u)

End
P = 3u × 3 (9u)
M = 4u × 3 (12u)

5u = 10
1u = 10 ÷ 5
= 2
12u = 12 × 2
= 24
The puppy’s mother was 24 kg.

Question 2

At first
B = 1u × 4 (4u)
G = 2u × 4 (8u)

End
B = 4u
G = 5u

4u = 40
1u = 40 ÷ 4
= 10
3u = 3 × 10
= 30
30 girls who had left the hall.

Question 3

At first
R = 3u × 4 (12u)
S = 7u × 4 (28u)

End
R = 4u × 3 (12u)
S = 5u × 3 (15u)

Difference = 28u - 15u
= 13u

Mrs Han had 432 fruits.
Answer to Unit 2.5

**Question 3 (cont.)**

13u = 39
1u = 39 ÷ 13
     = 3
Difference at first = 28u – 12u
                 = 16u

16u = 16 × 3
     = 48
Jen had **48 more sunflowers** than roses at first.

**Question 4**

At first
A = 5u³ (15u)
B = 3u³ (9u)

Difference = 20u – 9u
           = 11u

End
A = 3u³ (15u)
B = 4u³ (20u)

11u = 33
1u = 33 ÷ 11
    = 3
15u = 15 × 3
     = 45
**45 customers** were in Restaurant A.

**Question 5**

At first
E = 2u³ (6u)
A+S = 3u³ (9u)

Difference = 9u – 2u
            = 7u

End
E = 3u³ (6u)
A+S = 1u³ (2u)

7u = 42
1u = 42 ÷ 7
    = 6
Total at first = 6u + 9u
               = 15u
15u = 15 × 6
    = 90
There were **90 toys** in the shop.

**Question 6**

At first
S+M = 4u³ (12u)
W = 5u³ (15u)

Difference = 20u – 15u
            = 5u

End
S+M = 3u³ (12u)
W = 5u³ (20u)

5u = 300
1u = 300 ÷ 5
    = 60

**Answer to Unit 2.5**

**Question 6 (cont.)**

20u = 20 × 60
    = 1200
There were **1200 ml** of water in the mixture in the end.

**Answer to Unit 2.6**

**Let’s Get Started 2.6**

<table>
<thead>
<tr>
<th>Quantity in units</th>
<th>Value of 1u</th>
</tr>
</thead>
<tbody>
<tr>
<td>Items</td>
<td>Peter</td>
</tr>
<tr>
<td></td>
<td>5u³ (25u)</td>
</tr>
<tr>
<td>At first</td>
<td>25u – 16u</td>
</tr>
<tr>
<td>What happened?</td>
<td>–36</td>
</tr>
<tr>
<td>In the end</td>
<td>2u³ (16u)</td>
</tr>
</tbody>
</table>

**Think Further**

1.
At first
A = 1u³ (3u)
C = 3u³ (9u)
Difference = 2u³ (6u)

End
A = 2u³ (4u)
C = 5u³ (10u)
Difference = 3u³ (6u)

1u = 28
10u = 10 × 28
    = 280
There were **280 children** in the train at the end.

**Let’s Practise 2.6**

**Question 1**

At first
O = 1u³ (7u)
R = 5u³ (35u)
Total = 6u³ (42u)

Difference = 18u – 7u
            = 11u

End
O = 3u³ (18u)
R = 4u³ (24u)
Total = 7u³ (42u)

11u = 44
1u = 44 ÷ 11
    = 4
35u = 35 × 4
    = 140
There were **140 pots** of roses at first.
Answer to Unit 2.6

**Question 2**
At first
\[ B = 2u^3 \times (18u) \]
\[ G = 3u^3 \times (27u) \]
Total = 5u^3 (45u)

End
\[ B = 4u^3 \times (20u) \]
\[ G = 5u^3 \times (25u) \]
Total = 9u^3 (45u)

\[ 2u = 12 \]
\[ 1u = 12 ÷ 2 \]
\[ = 6 \]
\[ 18u = 18 \times 6 \]
\[ = 108 \]

There were 108 boys in the gym.

**Question 3**
At first
\[ P = 3u^3 \times (24u) \]
\[ M = 4u^3 \times (32u) \]
Total = 7u^3 (56u)

End
\[ P = 5u^3 \times (35u) \]
\[ M = 3u^3 \times (21u) \]
Total = 8u^3 (56u)

\[ 11u = 77 \]
\[ 1u = 77 ÷ 11 \]
\[ = 7 \]
\[ 24u = 24 \times 7 \]
\[ = 168 \]

Paul had 168 ants.

**Question 4**
At first
\[ A = 4u^3 \times (28u) \]
\[ N = 5u^3 \times (35u) \]
Total = 9u^3 (63u)

End
\[ A = 2u^3 \times (18u) \]
\[ N = 5u^3 \times (45u) \]
Total = 7u^3 (63u)

\[ 10u = 40 \]
\[ 1u = 40 ÷ 10 \]
\[ = 4 \]
\[ 28u = 28 \times 4 \]
\[ = 112 \]

Alisha had 112 stickers at first.

**Question 5**
30 min
\[ C = 1u \]
\[ I = 9u \]
Total = 10u

\[ Difference = 4u - 1u = 3u \]

45 min
\[ C = 2u^2 \times (4u) \]
\[ I = 3u^2 \times (6u) \]
Total = 5u^2 (10u)

\[ 3u = 12 \]
\[ 1u = 12 ÷ 3 \]
\[ = 4 \]
\[ 10u = 10 \times 4 \]
\[ = 40 \]

There were 40 questions.

**Question 6**
At first
\[ U = 9u \]
\[ P = 5u \]
Total = 14u

End
\[ U = 4u^2 \times (8u) \]
\[ P = 3u^2 \times (6u) \]
Total = 7u^2 (14u)

\[ 1u = 4 \]
\[ 14u = 14 \times 4 \]
\[ = 56 \]

There were 56 cars in the workshop.

---

**Answer to Unit 2.7**

**Let's Get Started 2.7**

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity in units</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Annie</td>
<td>Mother</td>
</tr>
<tr>
<td><strong>Now</strong></td>
<td>[ 1u^2 \times (2u) ]</td>
<td>[ 6u^2 \times (12u) ]</td>
</tr>
<tr>
<td><strong>What happened?</strong> (9 years later)</td>
<td>+9</td>
<td>+9</td>
</tr>
<tr>
<td><strong>Future</strong></td>
<td>[ 1u^5 \times (5u) ]</td>
<td>[ 3u^5 \times (15u) ]</td>
</tr>
</tbody>
</table>
Answer to Unit 2.7

Ask Yourself
1. Overlapping figures where an equal area is being removed or cut from each of the figures.

Let’s Practise 2.7

Question 1

At first
A = 2u\text{\textsuperscript{4}} (8u)
C = 5u\text{\textsuperscript{4}} (20u)
Difference = 3u\text{\textsuperscript{4}} (12u)

End
A = 1u\text{\textsuperscript{3}} (3u)
C = 5u\text{\textsuperscript{3}} (15u)
Difference = 4u\text{\textsuperscript{3}} (12u)

Difference = 8u – 3u = 5u

End
A = 1u\text{\textsuperscript{3}} (3u)
C = 5u\text{\textsuperscript{3}} (15u)
Difference = 4u\text{\textsuperscript{3}} (12u)

5u = 145
1u = 145 ÷ 5
= 29
28u = 28 × 29
= 812

There were 812 people in the conference hall at first.

Question 2

At first
Difference = 8 metres

End
L = 13u
S = 8u
Difference = 5u
5u = 8
1u = 8 ÷ 5
= 1.6
21u = 1.6 × 21
= 33.6
Total length removed = 34 – 33.6
= 0.4
Length removed from each = 0.4 ÷ 2
= 0.2
0.2 m was cut off from each piece of rope.

Question 3

Now
J = 1u\text{\textsuperscript{3}} (3u)
F = 3u\text{\textsuperscript{3}} (9u)
Difference = 2u\text{\textsuperscript{3}} (6u)

5 years later
J = 2u\text{\textsuperscript{2}} (4u)
F = 5u\text{\textsuperscript{2}} (10u)
Difference = 3u\text{\textsuperscript{2}} (6u)

5 years later

J = 3u\text{\textsuperscript{2}} (9u)
F = 5u\text{\textsuperscript{2}} (15u)
Difference = 2u\text{\textsuperscript{2}} (6u)

Difference = 4u – 3u = 1u

J = 3u\text{\textsuperscript{2}} (9u)
F = 5u\text{\textsuperscript{2}} (15u)
Difference = 2u\text{\textsuperscript{2}} (6u)

Difference = 4u – 3u = 1u

1u = 5

Question 3 (cont.)

Now
Jasper, 3u = 3 × 5
= 15

Father, 9u = 9 × 5
= 45

Jasper’s and his father’s present ages are 15 years old and 45 years old respectively.

Question 4

? years ago
G = 3u
N = 7u
Difference = 4u

Now
G = 4u\text{\textsuperscript{4}} (16u)
N = 5u\text{\textsuperscript{4}} (20u)
Difference = 4u

Sum of their ages now = 136 – 14 – 14
= 108
16u + 20u = 108
36u = 108
1u = 108 ÷ 36
= 3
Change = 16u – 3u
= 13u
13u = 13 × 3
= 39

George was \frac{3}{7} of Nathan age 39 years ago.

Question 5

At first
A + B = 3u\text{\textsuperscript{2}} (6u)
C + B = 5u\text{\textsuperscript{2}} (10u)
Difference = 2u\text{\textsuperscript{2}} (4u)

End
A = 3u
C = 7u
Difference = 4u

Shaded part (B) = 6u – 3u
= 3u

3u = 36
1u = 36 ÷ 3
= 12
A + B + C = 3u + 3u + 7u
= 13u
13u = 13 × 12
= 156

The area of the figure is 156 cm\text{\textsuperscript{2}}.
Answer to Unit 2.7

Question 6

At first

\[ A + B + C + D = 5u^2 \] (10u)

\[ B + C + D + E = 7u^2 \] (14u)

Difference = \(2u^2\) (4u)

End

\[ A + C = 5u \]

\[ C + E = 9u \]

Difference = \(4u\)

Shaded part \((B+D)\) = 14u – 9u

\[ = 5u \]

5u = 45

1u = 45 ÷ 5

= 9

Unshaded area of square and the quadrilateral

= \(C + E\)

= 9u

= 9 x 9

= 81

The area of the unshaded part of the square and quadrilateral is 81 cm².

Answers to Unit 2.8

Let’s Get Started 2.8

Change 1 (Both Add)

\[
\begin{array}{ccc}
R & W \\
7u & 3u & 13 \\
7u & 39 & 13 \\
4p & & \\
\end{array}
\]

3u = 39

1u = 39 ÷ 3

= 13

Change 2 (Both Subtract)

\[
\begin{array}{ccc}
R & W \\
5p & 65 & 48 \\
5p & 65 & \\
7u & 4u & \\
\end{array}
\]

4u = 48

1u = 48 ÷ 4

= 12

Ask Yourself

1. We make the end parts the same to help us draw the model to arrive at the value of the 1 unit in order to solve the problem sum.

Let’s Practise 2.8

Question 1

\[
\begin{array}{ccc}
R & W \\
3u & 28 & 42 \\
3u & 28 & \\
8u & & \\
\end{array}
\]

5u = 28 + 42

= 70

1u = 70 ÷ 5

= 14

(a) 1u = 120 – 60

= 60

3u = 3 x 60

= 180

Rodney had 180 sweets.

(b) 2u = 2 x 60

= 120

Bryan had 120 sweets.

Question 2

\[
\begin{array}{ccc}
R & W \\
8u & 1u & 60 \\
8u & 60 & 60 \\
\end{array}
\]

12p

(a) 1u = 120 – 60

= 60

3u = 3 x 60

= 180

Rodney had 180 sweets.

(b) 2u = 2 x 60

= 120

Bryan had 120 sweets.
Answer to Unit 2.8

Question 2 (cont.)
5u = 150 – 80
   = 70
1u = 70 ÷ 5
   = 14
(a) 3u = 3 x 14
   = 42
There were 42 boxes of Soap A at first.
(b) 5u + 20 = 5 x 14 + 20
   = 90
There were 90 boxes of Soap B in the end.

Question 3

<table>
<thead>
<tr>
<th>Actual</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>2u = 3s</td>
<td>3u</td>
</tr>
<tr>
<td>Change</td>
<td>−30 = 3s</td>
<td>+25</td>
</tr>
<tr>
<td>In the end</td>
<td>1p = 5</td>
<td>5p</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Working</th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>10u</td>
<td>3u</td>
</tr>
<tr>
<td>Change</td>
<td>−150</td>
<td>+25</td>
</tr>
<tr>
<td>In the end</td>
<td>5p</td>
<td>5p</td>
</tr>
</tbody>
</table>

(a) 7u = 150 + 25
     = 175
1u = 175 ÷ 7
    = 25
2u – 30 = 2 x 25 – 30
    = 20
There were 20 oranges in Box A in the end.
(b) Box B (end), 3u + 25 = 3 x 25 + 25
    = 100
Difference = 100 – 20
            = 80
There were 80 more oranges in Box B than Box A in the end.

Question 4

<table>
<thead>
<tr>
<th>Actual</th>
<th>O</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>3u = 3s</td>
<td>4u</td>
</tr>
<tr>
<td>Change</td>
<td>−20 = 3s</td>
<td>+30</td>
</tr>
<tr>
<td>In the end</td>
<td>1p = 5</td>
<td>2p</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Working</th>
<th>O</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>6u</td>
<td>4u</td>
</tr>
<tr>
<td>Change</td>
<td>−40</td>
<td>+30</td>
</tr>
<tr>
<td>In the end</td>
<td>2p</td>
<td>2p</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Actual</th>
<th>P</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>1500 = 3s</td>
<td>2840</td>
</tr>
<tr>
<td>Change</td>
<td>−5u = 3s</td>
<td>−2u</td>
</tr>
<tr>
<td>In the end</td>
<td>1p = 5</td>
<td>2p</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Working</th>
<th>P</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>3000</td>
<td>2840</td>
</tr>
<tr>
<td>Change</td>
<td>−10u</td>
<td>−2u</td>
</tr>
<tr>
<td>In the end</td>
<td>2p</td>
<td>2p</td>
</tr>
</tbody>
</table>
Answer to Unit 2.8

Question 6 (cont.)

\[ \begin{align*}
8u &= 3000 - 2840 \\
   &= 160 \\
1u &= 160 \div 2 \\
   &= 20
\end{align*} \]

Peter, end = 1500 - 5 x 20 
   = 1400

Dave, end = 2840 - 2 x 20 
   = 2800

Peter and Dave had 1400 and 2800 stickers respectively in the end.

Answer to Unit 2.9

Let’s Get Started 2.9

<table>
<thead>
<tr>
<th>S/N</th>
<th>Model drawing</th>
<th>Numerators the Same</th>
</tr>
</thead>
</table>
| 3.  | \[ \begin{align*}
J &= 4u^2(12u) \quad 3u^3(9u) \\
K &= 3u^3(12u) \quad 4u^4(16u)
\end{align*} \] \\
Total units | J = 21u \\
K = 28u |
| 4.  | \[ \begin{align*}
J &= 2u^3(10u) \quad 9u^5(45u) \\
K &= 5u^2(10u) \quad 3u^4(8u)
\end{align*} \] \\
Total units | J = 55u \\
K = 16u |
| 5.  | \[ \begin{align*}
J &= 3u \quad 4u \\
K &= 3u \quad 1u
\end{align*} \] \\
Total units | J = 7u \\
B = 4u |

Ask Yourself

1. When phrase “is equal to” is between two given fractions.

Think Further

1. \(32u + 35u = 201\) \\
   \(67u = 201\) \\
   \(1u = 201 \div 67\) \\
   \(= 3\)

   Muffins sold = \((32u + 35u) - (20u \times 2)\) \\
   \(= 27u\) \\
   \(27u = 27 \times 3\) \\
   \(= 81\)

   Mrs Heng sold a total of 81 muffins.

2. I will make the denominators the same when the items being compared are from the same whole unit/group.

Let’s Practise 2.9

Question 1

Left

\[ \begin{align*}
\frac{5 \times 2}{7 \times 2} A &= \frac{2 \times 5}{5 \times 5} B \\
\frac{10}{14} A &= \frac{10}{25} B
\end{align*} \]

At first

Shop A = 14u \\
Shop B = 25u

Difference = 25u - 14u \\
\(= 11u\)

\(11u = 396\) \\
\(1u = 396 \div 11\) \\
\(= 36\)

25u = 25 x 36 \\
\(= 900\)

Shop B had 900 apples in at first.

Question 2

\[ \begin{align*}
\frac{3 \times 5}{8 \times 5} D &= \frac{5 \times 3}{6 \times 3} L \\
\frac{15}{40} D &= \frac{15}{18} L
\end{align*} \]

At first

D = 40u \\
L = 18u

Difference = 40u - 18u \\
\(= 22u\)

22u = 44 \\
1u = 44 \div 22 \\
\(= 2\)

Total = 40u + 18u \\
\(= 58u\)

58u = 58 x 2 \\
\(= 116\)

Their total allowance is $116.
Answer to Unit 2.9

Answer to Unit 2.9

Question 3

Left
\[ \frac{4}{11} J = \frac{2 \times 2}{7 \times 2} D \]
\[ \frac{4}{11} J = \frac{4}{14} D \]
At first
\[ J = 11u \]
\[ D = 14u \]
Difference = \[14u - 11u = 3u\]
\[ 3u = 36 \]
\[ 1u = 36 ÷ 3 \]
\[ 12 = 12 \]
\[ 8u = 8 \times 12 \]
\[ 96 = 96 \]
They had a total of 96 marbles in the end.

Question 4

Left
\[ \frac{1 \times 4}{7 \times 4} R \text{ is twice of } \frac{2}{5} W \]
\[ \frac{4}{28} R \text{ is twice of } \frac{2}{5} W \]
At first
\[ R = 28u \]
\[ W = 5u \]
Difference = \[28u - 5u = 23u\]
\[ 23u = 46 \]
\[ 1u = 46 ÷ 23 \]
\[ 2 = 2 \]
\[ 28u = 2 \times 28 \]
\[ 56 = 56 \]
Roy had 56 toy cars.

Question 5

Left
\[ K = 1u^3 \text{ (3u)} \]
\[ C = 2u^3 \text{ (6u)} \]
\[ \frac{3}{5} K \text{ is half of } \frac{2 \times 3}{3 \times 3} C \]
\[ \frac{3}{5} K \text{ is half of } \frac{6}{9} C \]
At first
\[ K = 5u \]
\[ C = 9u \]
Total = \[5u + 9u = 14u\]
\[ 14u = 350 \]
\[ 1u = 350 ÷ 14 \]
\[ 25 = 25 \]

Question 5 (cont.)

Difference = \[9u - 5u = 4u\]
\[ 4u = 4 \times 25 \]
\[ = 100 \]
Claudia had 100 more stickers than Kim.

Question 6

End
\[ X = 3u^6 \text{ (18u)} \]
\[ Z = 1u^6 \text{ (6u)} \]
\[ \frac{3 \times 6}{5 \times 6} X \text{ is thrice of } \frac{6}{11} Z \]
\[ \frac{18}{30} X \text{ is thrice of } \frac{6}{11} Z \]
At first
\[ X = 30u \]
\[ Z = 11u \]
Total = \[30u + 11u = 41u\]
\[ 41u = 656 \]
\[ 1u = 656 ÷ 41 \]
\[ = 16 \]
(a) \[30u = 30 \times 16 \]
\[ = 480 \]
Xavier received $480 from his father.
(b) Z’s deposit amount = \[5u\]
\[ = 5 \times 16 \]
\[ = 80 \]
Increase by \[\frac{1}{4}\] of savings = $80
Savings (in the end) = \[80 \times 5 \]
\[ = 400 \]
Zane’s savings in the bank was $400 in the end.

Answer to Unit 2.10

Let’s Get Started 2.10

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>x</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>5u</td>
<td>4</td>
<td>20u</td>
<td>20u</td>
</tr>
<tr>
<td>M</td>
<td>3u</td>
<td>2</td>
<td>6u</td>
<td>6u</td>
</tr>
<tr>
<td>Total</td>
<td>8u = 40</td>
<td></td>
<td>26u = 130</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>x</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50¢ coin</td>
<td>1u</td>
<td>0.5</td>
<td>0.5u</td>
<td></td>
</tr>
<tr>
<td>$1 coin</td>
<td>2u</td>
<td>1</td>
<td>2u</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>3u = 15</td>
<td></td>
<td>2.5u = 12.5</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>x</th>
<th>Value of items (legs)</th>
<th>Total value (legs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>4u</td>
<td>4</td>
<td>16u</td>
<td>16u</td>
</tr>
<tr>
<td>D</td>
<td>6u</td>
<td>2</td>
<td>12u</td>
<td>12u</td>
</tr>
<tr>
<td>Total</td>
<td>10u = 120</td>
<td></td>
<td>28u = 336</td>
<td></td>
</tr>
</tbody>
</table>
Answer to Unit 2.10

Ask Yourself
1. In Quantity × Value, the quantity/number of units of each item is given but in Guess and Check, only the total number of items are given.

Let’s Practise 2.10

Question 1

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($/wheel)</th>
<th>Total value (wheels)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S</td>
<td>3u</td>
<td>×</td>
<td>2</td>
<td>6u</td>
</tr>
<tr>
<td>D</td>
<td>1u</td>
<td>×</td>
<td>3</td>
<td>3u</td>
</tr>
<tr>
<td>Total</td>
<td>4u</td>
<td></td>
<td></td>
<td>9u</td>
</tr>
</tbody>
</table>

9u = 225
1u = 225 ÷ 9

There were 100 bicycles altogether.

Question 2

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($/unit)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>5u</td>
<td>×</td>
<td>10</td>
<td>50u</td>
</tr>
<tr>
<td>C</td>
<td>12u</td>
<td>×</td>
<td>4</td>
<td>48u</td>
</tr>
<tr>
<td>Total</td>
<td>17u</td>
<td></td>
<td></td>
<td>98u</td>
</tr>
</tbody>
</table>

(a) 98u = 9800
1u = 9800 ÷ 98

There were a total of 1200 children.

(b) Difference = 50u – 48u

2u = 2 × 100

The difference in the total amount of money collected between the adults and children was $200.

Question 3

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>1u</td>
<td>×</td>
<td>1.1</td>
<td>1.1u</td>
</tr>
<tr>
<td>V</td>
<td>1u</td>
<td>×</td>
<td>1.2</td>
<td>1.2u</td>
</tr>
<tr>
<td>C</td>
<td>2u</td>
<td>×</td>
<td>1.4</td>
<td>2.8u</td>
</tr>
<tr>
<td>Total</td>
<td>4u</td>
<td></td>
<td></td>
<td>5.1u</td>
</tr>
</tbody>
</table>

5.1u = 153
1u = 153 ÷ 5.1

= 30

Answer to Unit 2.10

Question 3 (Cont.)

2u = 2 × 30

= 60

Sarah bakes 30 red velvet muffins, 30 vanilla muffins and 60 chocolate muffins.

Question 4

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1u</td>
<td>×</td>
<td>0.4</td>
<td>0.4u</td>
</tr>
<tr>
<td>O</td>
<td>1u</td>
<td>×</td>
<td>0.5</td>
<td>0.5u</td>
</tr>
<tr>
<td>P</td>
<td>4u</td>
<td>×</td>
<td>0.6</td>
<td>2.4u</td>
</tr>
<tr>
<td>Total</td>
<td>6u</td>
<td></td>
<td></td>
<td>3.3u</td>
</tr>
</tbody>
</table>

3.3u = 39.6
1u = 39.6 ÷ 3.3

= 12

Total spent on apples and oranges = 0.4u + 0.5u

= 0.9u

Difference = 2.4u – 0.9u

= 1.5u

1.5u = 1.5u × 12

= 18

He spent $18 more on the pears than apples and oranges.

Question 5

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items (g)</th>
<th>Total value (g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>3u</td>
<td>×</td>
<td>30</td>
<td>90u</td>
</tr>
<tr>
<td>B</td>
<td>4u</td>
<td>×</td>
<td>40</td>
<td>160u</td>
</tr>
<tr>
<td>S</td>
<td>9u</td>
<td>×</td>
<td>50</td>
<td>450u</td>
</tr>
<tr>
<td>Total</td>
<td>16u</td>
<td></td>
<td></td>
<td>700u</td>
</tr>
</tbody>
</table>

700u = 14 000
1u = 14 000 ÷ 700

= 20

160u = 160 × 20

= 3200

(a) The mass of flour needed is 3200 g.

Difference = 9u – 3u

= 6u

6u = 6 × 20

= 120

(b) The difference in the number of strawberry muffins and the number of raspberry muffins is 120.
**Answer to Unit 2.10**

**Question 6**

\[\begin{align*} 
2x & = 5x + G \\
3x & = 6x + G \\
\frac{10}{15} & = \frac{10}{G} \\
B & = 15u \\
G & = 12u \\
\text{Total} & = 15u + 12u = 27u \\
A & = \frac{1}{3} \times 27u = 9u \\
\end{align*} \]

\[
\begin{array}{|c|c|c|c|}
\hline
\text{Items} & \text{Quantity of items} & \text{Value of items ($)} & \text{Total value ($)} \\
\hline
B & 15u & \times & 4 \times 60u \\
G & 12u & \times & 5 \times 60u \\
A & 9u & \times & 10 \times 90u \\
\hline
\text{Total} & 36u & \times & 210u \\
\hline
\end{array}
\]

\[\begin{align*} 
\text{Difference} & = 90u - 60u \\
& = 30u \\
30u & = 3000 \\
1u & = 3000 \div 30 \\
& = 100 \\
210u & = 210 \times 100 \\
& = 21000 \\
\end{align*} \]

(a) The total amount collected from the donations is \$21,000.

\[
\begin{align*} 
\text{Total adults and girls} & = 9u + 12u \\
& = 21u \\
21u & = 21 \times 100 \\
& = 2100 \\
\end{align*} \]

(b) There is a total of 2100 adults and girls.

**Answer to Review Questions on Chapter 2**

**Question 1**

\[
\begin{align*} 
A + B & = 3u^2 \times (18u) \\
C & = 2u^3 \times (12u) \\
\text{Total} & = 5u^5 \times (30u) \\
A + C & = 5u^3 \times (25u) \\
B & = 1u^3 \times (5u) \\
\text{Total} & = 6u^5 \times (30u) \\
\end{align*} \]

\[\begin{align*} 
12u & = 144 \\
1u & = 144 \div 12 \\
& = 12 \\
30u & = 30 \times 12 \\
& = 360 \\
\end{align*} \]

The pair of earrings cost \$360.

**Question 2**

\[
\begin{align*} 
J + E & = 3u^2 \times (18u) \\
G + R & = 4u^3 \times (24u) \\
\text{Total} & = 7u^5 \times (42u) \\
J + E + G & = 3u^2 \times (18u) \\
G + R & = 4u^3 \times (24u) \\
\text{Total} & = 7u^5 \times (42u) \\
J & = 1u^2 \times (3u) \\
E & = 5u^3 \times (15u) \\
J + E & = 6u^3 \times (18u) \\
\end{align*} \]

\[\begin{align*} 
\text{Summary} & \quad J = 3u \\
E & = 15u \\
G & = 17u \\
R & = 7u \\
\text{Total} & = 42u \\
\text{Difference} & = 17u - 15u = 2u \\
2u & = 16 \\
1u & = 16 \div 2 \\
& = 8 \\
42u & = 42 \times 8 = 336 \\
\end{align*} \]

The four children managed to pool **336 marbles** together.

**Question 3**

At first
\[
\begin{align*} 
R & = 2u^2 \times (4u) \\
M & = 1u^2 \times (2u) \\
\text{Change 1} & \quad R = 4u + 1u = 5u \\
M & = 2u - 1u = 1u \\
\end{align*} \]

End
\[
\begin{align*} 
R & = 5u - 3u = 2u \\
M & = 1u + 3u = 4u \\
\text{Difference} & = 4u - 2u = 2u \\
2u & = 4 \\
1u & = 4 \div 2 \\
& = 2 \\
4u & = 4 \times 2 = 8 \\
\end{align*} \]

Robert and Melvin had 8 magnets and 4 magnets respectively at first.

**Question 4**

\[
\begin{align*} 
\text{People} & \quad 7u^2 \times (14u) \\
\text{Adults (Participants)} & \quad 3u^2 \times (6u) \\
\text{Remaining} & \quad 4u^2 \times (8u) \\
\text{Girls (Participants)} & \quad 1u^2 \times (2u) \\
\text{Boys (Participants)} & \quad 3u^2 \times (6u) \\
\text{Left} & \quad 2u^3 \times (6u) \\
\text{Organisers} & \quad 1u^3 \times (3u) \\
\end{align*} \]
Answer to Review Questions on Chapter 2

Question 4 (cont.)

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>6u</td>
<td>×</td>
<td>2</td>
<td>12u</td>
</tr>
<tr>
<td>G</td>
<td>2u</td>
<td>×</td>
<td>5</td>
<td>10u</td>
</tr>
<tr>
<td>B</td>
<td>3u</td>
<td>×</td>
<td>6</td>
<td>18u</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>40u</td>
</tr>
</tbody>
</table>

40u = 400
1u = 400 ÷ 40
= 10
18u = 18 × 10
= 180

The boys spent $180 on drinks.

(b) 3u = 3 × 10
= 30

30 people were event organisers.

(c) 14u = 14 × 10
= 140

There were 140 people at the event.

Question 5

\[
\begin{align*}
\frac{3}{7}A &= \frac{3}{7}B \\
\frac{6}{15}A &= \frac{8}{15}B \\
A &= 15u^2 \text{ (30u)} \\
B &= 8u^2 \text{ (16u)} \\
\frac{3}{7}C &= \frac{4}{7}C \\
\frac{12}{32}B &= \frac{7}{32}C \\
B &= 16u \\
C &= 21u
\end{align*}
\]

Summary

A = 30u
B = 16u
C = 21u

Difference = 30u – 21u
= 9u
9u = 45
1u = 45 ÷ 9
= 5
16u = 16 × 5
= 80

There are 80 pineapples in Basket B.

Question 6

\[
\begin{align*}
3u + 1u &= 10u \\
E + R &= 7u \\
\text{Summary} &
\end{align*}
\]

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>3u</td>
<td>×</td>
<td>1.95</td>
<td>5.85u</td>
</tr>
<tr>
<td>E</td>
<td>5u</td>
<td>×</td>
<td>0.75</td>
<td>3.75u</td>
</tr>
<tr>
<td>R</td>
<td>2u</td>
<td>×</td>
<td>2.2</td>
<td>4.4u</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td>14u</td>
</tr>
</tbody>
</table>

Question 7

Fraction of ducks left = \(1 - \frac{5}{7}\)
= \(\frac{2}{7}\)

Fraction of chickens left = \(1 - \frac{2}{5}\)
= \(\frac{3}{5}\)

\[
\begin{align*}
3 \times \frac{3}{7} = \frac{9}{7} & \text{ D} \\
\frac{6}{22} \times \frac{6}{21} = \frac{6}{31} & \text{ D} \\
C &= 10u \\
D &= 21u
\end{align*}
\]

Total (at first) = 10u + 21u
= 31u

Sold = 15u + 4u
= 19u
19u = 855
1u = 855 ÷ 19
= 45
31u = 31 × 45
= 1395

There were a total of 1395 animals at Farmer Oei’s farm at first.

Question 8

\[
\begin{align*}
\text{Total amount of money} &
\end{align*}
\]

D

\$940

\(\frac{2}{9}\) of total = 6u + 180
\(\frac{5}{9}\) of total = 3u + 90
\(\frac{1}{9}\) of total = 27u + 810

Dress = 27u + 810 – 14u
= 13u + 810
13u = 940 – 810
= 130
1u = 130 ÷ 13
= 10
27u + 810 = 27 × 10 + 810
= 1080

Niki had $1080 at first.

Question 9

\[
\begin{align*}
\frac{3}{11}N &= \frac{3}{11}E \\
\frac{6}{22}N &= \frac{6}{22}E
\end{align*}
\]

N = 22u
E = 27u
Question 9 (Cont.)

Total = 22u + 27u  
= 49u
Spent = 6u + 6u  
= 12u
Left = 49u – 12u  
= 37u

37u = 3700
1u = 3700 ÷ 37
= 100

22u = 22 × 100
= 2200

Norman’s savings was $2200.

Question 10

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>3u + 15</td>
<td>×</td>
<td>3.5</td>
<td>10.5u + 52.5</td>
</tr>
<tr>
<td>R</td>
<td>3u</td>
<td>×</td>
<td>9u</td>
<td>27u</td>
</tr>
<tr>
<td>P</td>
<td>1u + 5</td>
<td>×</td>
<td>2.9</td>
<td>9.5u + 14.5</td>
</tr>
<tr>
<td>Total</td>
<td>7u + 20</td>
<td></td>
<td></td>
<td>22.4u + 67</td>
</tr>
</tbody>
</table>

22.4u = 179 – 67  
= 112  
1u = 112 ÷ 22.4  
= 5  
7u + 20 = 7 × 5 + 20  
= 55

They sell 55 pieces of tokiwado daily.

Question 11

\[
\frac{x^2}{y^2} \cdot \frac{a}{b} = \frac{x^2 \cdot a}{y^2 \cdot b}
\]

A = \frac{9u}{8u}

In the end

A

N

At first

A

N

1u = 89 + 65  
= 154  
9u = 9 × 154  
= 1386  
8u = 8 × 154  
= 1232

Alyssa and Nerissa had $1386 and $1232 respectively.

Question 12

\[
\begin{align*}
L & = 5u \\
K & = 6u \\
I & = 5u \\
\text{In the end} & \\
\begin{array}{c|c}
L & 10 \\
I & 10 \\
\hline
5p & 60 \\
\end{array}
\end{align*}
\]

2p = 60  
1p = 60 ÷ 2  
= 30  
3p = 3 × 30  
= 90  
L (at first) = 90 – 10  
= 80  
5u = 80  
1u = 80 ÷ 5  
= 16  
6u = 6 × 16  
= 96  
K (end) = 96 – 10 – 70  
= 16

Kevin had 16 cards in the end.

Answers to Unit 3.1

Let’s Get Started 3.1

<table>
<thead>
<tr>
<th>Ratio Compa rison</th>
<th>Which item(s) is/are repeated?</th>
<th>Step 1</th>
<th>Step 2 Create a Summary ratio of the items</th>
</tr>
</thead>
</table>
| S : H             | 1 : 6                          | S+H    | S : H : S+H 1\textsuperscript{st} : 6\textsuperscript{st} : 7\textsuperscript{nd}  
2 : 12 : 14        |
| P : S+H          | 9 : 14                         | P : S+H| 9 : 14                        |
| X : Y : Z         | 9 : 2 : 4                      | X+Y    | X : Y : Z : X+Y 9\textsuperscript{th} : 2\textsuperscript{nd} : 4\textsuperscript{rd} : 11\textsuperscript{th}  
18 : 4 : 8 : 22    |
| W : X+Y          | 5 : 2                          | W : X+Y| 5\textsuperscript{th} : 2\textsuperscript{nd}  
55 : 22            |
| C : D             | 5 : 9                          | C+D    | C : D : C+D 5 : 9 : 14  
A : C+D 2 : 7       |
| A : C+D          | 2 : 7                          | A+C+D  | A : C+D : A+C+D 2\textsuperscript{nd} : 7\textsuperscript{th} : 9\textsuperscript{th}  
4 : 14 : 18        |
| J : A+C+D        | 1 : 2                          | J : A+C+D| 1\textsuperscript{st} : 2\textsuperscript{nd}  
9 : 18             |
Answers to Unit 3.1

Ask Yourself
1. The girls shared a number of biscuits together and the quantity by each girl is given in sets of ratio amongst them.
2. Since Hannah is the Repeated Item, the number of units representing Hannah in both sets of ratio must be made the same using the principle of the First Common Multiple (FCM) of 5 and 4 which is 20.

Let’s Practise 3.1

Question 1
J : D J : K
1 : 3 3 : 1
3 : 24
Summary
J : D : K
3 : 24 : 1
Total = 3u + 24u + 1u
= 28u
28u = 280
1u = 280 ÷ 28
= 10
Difference = 24u – 1u
= 23u
23u = 23 × 10
= 230
Duncan had 230 more coins than Keith.

Question 2
A + C : B A : C : A+C
2 : 5 3 : 1
10 : 15 8 : 2 : 10
Summary
A : B : C
8 : 15 : 2
7u = 147
1u = 147 ÷ 7
= 21
Total = 8u + 15u + 2u
= 25u
25u = 25 × 21
= 525
The three boys received $525 altogether.

Question 3
J : E : G J+G : J+G+E
1 : 2 4 : 5
2 : 8 : 10
Summary
J : E : G
2 : 3 : 5
10u = 80

Answers to Unit 3.1

Question 3 (Cont.)
1u = 80 ÷ 10
= 8
Difference between G and J = 3u
3u = 3 × 8
= 24
Grace has 24 more playing cards than Jason.

Question 4
G : C+D+J J : C+D : J+C+D C : D : C+D
2 : 10 3 : 10 4 : 6 : 5 1 : 5 : 6
20 : 30 24 : 6 : 30
Summary
G : J : C : D
20 : 24 : 1 : 5
44u = 132
1u = 132 ÷ 44
= 3
Total = 20u + 24u + 1u + 5u
= 50u
50u = 50 × 3
= 150
The four girls contributed a total of $150.

Question 5
B : C B : A
6 : 2 5 : 2
4 : 1 3 : 1
12 : 10 12 : 9
Summary
A : B : C
9 : 12 : 10
Unshaded = 9u + 10u
= 19u
19u = 38
1u = 38 ÷ 19
= 2
Shaded part B = 12u
12u = 12 × 2
= 24
The area of the shaded part is 24 cm².

Question 6
A : B : A+B A+B : B+C
2 : 1 3 : 1
4 : 2 6 : 3
Summary
A : B : C
4 : 2 : 3
Answers to Unit 3.1

Question 6 (cont.)

10 : 6
5
4
2
3

The area of the shaded part of the figure is 14 cm².

Answers to Unit 3.2

Let’s Get Started 3.2

<table>
<thead>
<tr>
<th>At first</th>
<th>What has happened</th>
<th>End (As a result)</th>
<th>What has not changed?</th>
<th>Find the value of 1 unit.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C : D</td>
<td>D received 4 more marbles.</td>
<td>C : D 6 : 17</td>
<td>C 17u – 15u = 2u 2u = 4 1u = 2</td>
<td></td>
</tr>
<tr>
<td>2³ : 5³</td>
<td>6 : 15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E : F</td>
<td>E won 22 cards.</td>
<td>E : F 2² : 3² 14 : 21</td>
<td>F 14u – 12u = 2u 2u = 22 1u = 11</td>
<td></td>
</tr>
<tr>
<td>4³ : 7³</td>
<td>12 : 21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G : H : K</td>
<td>H purchased 30 pencils and K gave away 45 Pencils.</td>
<td>G : H : K 4 : 8 : 7</td>
<td>G 8u – 6u = 2u 2u = 30 1u = 15</td>
<td></td>
</tr>
<tr>
<td>2⁵ : 3² : 5²</td>
<td>4 : 6 : 10</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A : O+P</td>
<td>21 apples are rotten and were thrown away.</td>
<td>A : O+P 1³ : 2³ 3 : 6</td>
<td>O + P 10u – 3u = 7u 7u = 21 1u = 3</td>
<td></td>
</tr>
<tr>
<td>5² : 3²</td>
<td>10 : 6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ask yourself
1. The change is the fifty-four $1 coins that were removed. To form the relationship based on the change, we write out the “At first” and “End” sets of ratio.
2. There is a change in the ratio as the total number of coins had changed given that some $1 coins were removed.
3. Since the number of 10-cent coins remained the same, the units representing the 10-cent coins must be made the same in the ‘Before/At first’ and ‘After/End’ ratios using the principle of First Common Multiple (FCM).

Think Further
1. Amount of money Patrick had in the end = (10 × 2 × 0.1) + (8 × 2 × 1) = $18

Let’s Practise 3.2

Question 1

<table>
<thead>
<tr>
<th>At first</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>G : B</td>
<td>G : B</td>
</tr>
<tr>
<td>2³ : 3³</td>
<td>3³ : 1³</td>
</tr>
<tr>
<td>6 : 9</td>
<td>6 : 2</td>
</tr>
</tbody>
</table>

Answers to Unit 3.2

Question 1 (cont.)

14 : 21
3
2
4
5
6

There were 16 dancers in the dance studio.

Question 2

At first
F : B
4² : 1²
3² : 2²
12 : 3

End
F : B
2² : 1²
12 : 8

Total, end = 12u + 8u = 20u

20u = 1000
1u = 100 ÷ 20 = 50
5u = 5 × 50 = 250

Cost for the bean curds ordered = 250 × $0.80 = $200

The cost of the beancurd added was $200.

Question 3

At first
E : P
5² : 3²
10 : 6

End
E : P
2² : 3²
10 : 15

9u = 45
1u = 45 ÷ 9 = 5

Erasers = 10u
10u = 10 × 5 = 50

Fraction of erasers lost = 25 ÷ 50
= ½

Keith lost ½ of his erasers.

Question 4

At first
C : B
3² : 2²
9 : 6

End
C : B
1² : 3²
2 : 6

No. of chocolates sold = 9u – 7u = 7u
7u = 28
1u = 28 ÷ 7 = 4
15u = 15 × 4 = 60

There were 60 cupcakes altogether at Cupalicious at first.
Answers to Unit 3.2

Question 5

At first

\[ \frac{H}{G} = \frac{3}{4} \]

End

\[ \frac{H}{G} = \frac{3}{4} \]

Hamster left

\[ \frac{7}{12} \]

\[ = \frac{3}{12} \]

\[ 7u = 21 \]

1u = 21 ÷ 7

= 3

Total = 12u + 4u

= 16u

16u = 16 × 3

= 48

Mr Rashid had 48 hamsters and guinea pigs in his pet shop.

Question 6

At first

\[ \frac{F}{N} = \frac{7}{3} \]

End

\[ \frac{F}{N} = \frac{14}{15} \]

Fiction books left

\[ = \frac{14}{21} \]

\[ = \frac{2}{3} \]

\[ 29u = 87 \]

1u = 87 ÷ 29

= 3

Fiction books donated = 21u – 14u

= 7u

7u = 7 × 3

= 21

He donated 21 books.

Answers to Unit 3.3

Let’s Get Started 3.3

<table>
<thead>
<tr>
<th>Change</th>
<th>At first</th>
<th>End</th>
<th>Put a tick if ( \text{Total Unchanged} )</th>
<th>Find the value of 1 unit.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A gave 4 pens to B</td>
<td>A : B = 3 : 5</td>
<td>A : B = 12 : 32</td>
<td>( \checkmark )</td>
<td>3u – 2u = 1u, 1u = 4</td>
</tr>
<tr>
<td>A and B gave away 16 pens each.</td>
<td>Total = 8u</td>
<td>Difference Unchanged</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>A bought 14 pens and B lost 14 pens.</td>
<td>A : B = 12 : 43</td>
<td>A : B = 25 : 110</td>
<td>( \checkmark )</td>
<td>10u – 3u = 7u, 7u = 14, 1u = 2</td>
</tr>
</tbody>
</table>

Answers to Unit 3.3

Ask Yourself

1. The total number of questions that needed to be solved remained the same throughout the 3-week period.

2. The total number of units in both ratios must be made the same since the total questions to be done and completed must remain the same within the 3-week period.

Let’s Practise 3.3

Question 1

At first

\[ \frac{P}{C} : \text{Total} = \frac{3}{10} : 10 \]

End

\[ \frac{P}{C} : \text{Total} = \frac{3}{15} : 4 \]

Difference, at first = 21u – 9u

= 12u

12u = 24

1u = 24 ÷ 12

= 2

Planes (end) = 10u

= 10 × 2

= 20

20u = 20 × 2

= 40

There were a total of 20 toy planes and 40 toy cars on the display shelves in the end.

Question 2

At first

\[ \frac{A}{M} : \text{Total} = \frac{8}{12} : 20 \]

End

\[ \frac{A}{M} : \text{Total} = \frac{15}{5} : 20 \]

7u = 84

1u = 84 ÷ 7

= 12

10u = 10 × 12

= 120

Alan had 120 more stamps than May in the end.

Question 3

First week

<table>
<thead>
<tr>
<th>S : U : Total</th>
<th>S : U : Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 : 14 : 20</td>
<td>6 : 14 : 20</td>
</tr>
</tbody>
</table>

Second week

9u = 36

1u = 36 ÷ 9

= 4

5u = 5 × 4

= 20

Dennis need to solve 20 questions in the third week to complete his assignment.
Answers to Unit 3.3

Question 4

Let's Practise 3.4

Question 1

End

A : C : Diff

3\(^2\) : 10\(^2\) : 7\(^2\)

9 : 30 : 21

7 : 28 : 21

2u = 20

1u = 20 ÷ 2 = 10

21u = 21 × 10 = 210

There were 210 more adults than in the end.

Question 2

End

50\(^c\) : $1 : Diff

50\(^c\) : $1 : Diff

2\(^\circ\) : 5\(^\circ\) : 3\(^\circ\)

5\(^\circ\) : 9\(^\circ\) : 4\(^\circ\)

8 : 20 : 12

15 : 27 : 12

7u = 14

1u = 14 ÷ 7 = 2

Total value of 50\(^c\) coins, in the end = 15u = 15 × 2 = 30

Total value of $1 coins, in the end = 27u = 27 × 2 = 54

No. of 50\(^c\) coins (end) = 30 ÷ 0.5 = 60

No. of $1 coins (end) = 54 ÷ 1 = 54

Danny had 60 fifty-cent coins and 54 one-dollar coins in the end.

Question 3

14 years’ ago

J : L : Diff

1\(^\circ\) : 4\(^\circ\) : 3\(^\circ\)

2 : 8 : 6

7u = 14

1u = 14 ÷ 7 = 2

Difference = 6u

= 6 × 2 = 12

Lin Xia is 12 years older than Joelle.

Ask Yourself

1. The amount of flour, the amount of sugar and the total amount of flour ‘At First’ and ‘End’ had changed. However, the difference between the amount of flour and sugar has remained unchanged.
Answers to Unit 3.4

Question 4

Two years’ ago

<table>
<thead>
<tr>
<th>J</th>
<th>G</th>
<th>P</th>
<th>Diff (J&amp;G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$4^2$</td>
<td>$7^2$</td>
<td>$1^2$</td>
<td>$3^2$</td>
</tr>
<tr>
<td>$8$</td>
<td>$14$</td>
<td>$2$</td>
<td>$6$</td>
</tr>
</tbody>
</table>

In 6 years after

<table>
<thead>
<tr>
<th>J</th>
<th>G</th>
<th>P</th>
<th>Diff J&amp;G</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3^3$</td>
<td>$5^3$</td>
<td>$2^3$</td>
<td></td>
</tr>
<tr>
<td>$9$</td>
<td>$15$</td>
<td>$6$</td>
<td></td>
</tr>
</tbody>
</table>

1u = $2 + 6$

= 8

Penny’s age, 2 years’ ago = 2u

= $2 \times 8$

= 16

Penny’s age now = 16 + 2

= 18

Penny is 18 years old now.

Question 5

\[ A + B : B + C : \text{Diff} \]

<table>
<thead>
<tr>
<th>$5^3$</th>
<th>$9^3$</th>
<th>$4^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>27</td>
<td>12</td>
</tr>
</tbody>
</table>

\[ A : C : \text{Diff} \]

<table>
<thead>
<tr>
<th>$1^3$</th>
<th>$7^3$</th>
<th>$6^3$</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>14</td>
<td>12</td>
</tr>
</tbody>
</table>

13u = 13u

Summary

\[ A : B : C \]

2 : 13 : 14

Area of square = $12 \times 12$

= 144

15u = 144

1u = $144 \div 15 = 9.6$

Area of shaded part B = 13u

= $13 \times 9.6$

= 124.8

Area of shaded part B is 124.8 cm².

Question 6

\[ A + B : B + C : \text{Diff} \]

<table>
<thead>
<tr>
<th>$2^3$</th>
<th>$3^2$</th>
<th>$1^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>6</td>
<td>2</td>
</tr>
</tbody>
</table>

\[ A : C : \text{Diff} \]

| $3$ | $5$ | $2$ |

\[ \text{Difference} = 6u - 4u \]

= 2u

2u = 32

1u = $32 \div 2$

= 16

Answers to Unit 3.5

Let’s Get Started

<table>
<thead>
<tr>
<th>Models (End)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
</tr>
<tr>
<td>P</td>
</tr>
</tbody>
</table>

Change 2

(Both subtracted)

<table>
<thead>
<tr>
<th>Models (End)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
</tr>
<tr>
<td>P</td>
</tr>
</tbody>
</table>

Type of Change

<table>
<thead>
<tr>
<th>Models (End)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
</tr>
<tr>
<td>P</td>
</tr>
</tbody>
</table>

\[ \text{Difference} = 180 + 66 = 80 \]

\[ 1u = 80 \div 8 \]

= 10

Ask Yourself

1. The number of almond cupcakes decreased and the number of walnut cupcakes increased. Their total and difference ‘At First’ and ‘End’ changed. In summary, everything changes (All Items Changed).

2. To solve such question, I need to make one of the unknowns to be the same (in this case, to make the ‘parts’ at the end the same).

Think Further

1. When an equal number of almond and walnut cupcakes were sold/removed, the difference between the 2 types of cupcakes would remain unchanged. The Difference Unchanged strategy will be used to solve the question.

Let’s Practise

Question 1

<table>
<thead>
<tr>
<th>(Actual)</th>
<th>C</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>4u</td>
<td>1u²</td>
</tr>
<tr>
<td>Change</td>
<td>+15</td>
<td>+10³</td>
</tr>
</tbody>
</table>

In the end 3p 1p³

<table>
<thead>
<tr>
<th>(Working)</th>
<th>C</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>4u</td>
<td>3u</td>
</tr>
<tr>
<td>Change</td>
<td>+15</td>
<td>+30</td>
</tr>
</tbody>
</table>

In the end 3p 3p
Answers to Unit 3.5

Question 1 (Cont.)

<table>
<thead>
<tr>
<th></th>
<th>C</th>
<th></th>
<th>P</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3u</td>
<td>1u</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3u</td>
<td>15</td>
<td>15</td>
<td></td>
<td>30</td>
</tr>
</tbody>
</table>

1u = 15
5u = 5 \times 15
= 75
Cherie had \textbf{75 hair accessories} at first.

Question 2

(\textbf{Actual})

<table>
<thead>
<tr>
<th></th>
<th>G</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>3u²</td>
<td>4u³</td>
</tr>
<tr>
<td>Change</td>
<td>-3u²</td>
<td>-14u³</td>
</tr>
</tbody>
</table>

In the end

|   | 3p² | 2p³ |

(\textbf{Working})

<table>
<thead>
<tr>
<th></th>
<th>G</th>
<th>J</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>6u</td>
<td>12u</td>
</tr>
<tr>
<td>Change</td>
<td>-6</td>
<td>-42</td>
</tr>
</tbody>
</table>

In the end

|   | 6p | 6p |

6u = 36
1u = 36 + 6
= 6
J (end) = 4u − 14
= 4 \times 6 − 14
= 10

Jiaying had \textbf{10 cakes} in the end.

Question 3

(\textbf{Actual})

<table>
<thead>
<tr>
<th></th>
<th>R</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>4u²</td>
<td>5u³</td>
</tr>
<tr>
<td>Change</td>
<td>+7u²</td>
<td>-14u³</td>
</tr>
</tbody>
</table>

In the end

|   | 3p² | 2p³ |

(\textbf{Working})

<table>
<thead>
<tr>
<th></th>
<th>R</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>8u</td>
<td>15u</td>
</tr>
<tr>
<td>Change</td>
<td>+14</td>
<td>-42</td>
</tr>
</tbody>
</table>

In the end

|   | 6p | 6p |

7u = 14 + 42
= 56
1u = 56 + 7
= 8
Difference between R and B at first = 1u
= 1 \times 8
= 8

There were \textbf{8 more} blue than red ornaments at first.

Question 4

(\textbf{Actual})

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>360</td>
<td>400</td>
</tr>
<tr>
<td>Change</td>
<td>-1u</td>
<td>-2u</td>
</tr>
</tbody>
</table>

In the end

|   | 4p | 4p |

(\textbf{Working})

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>360</td>
<td>1600</td>
</tr>
<tr>
<td>Change</td>
<td>-1u</td>
<td>-8u</td>
</tr>
</tbody>
</table>

In the end

|   | 4p | 4p |

7u = 840
1u = 840 \div 7
= 120
3u = 3 \times 120
= 360

\textbf{360 people} left the queue.

Question 5

(\textbf{Actual})

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>1u</td>
<td>3u</td>
</tr>
<tr>
<td>Change</td>
<td>-3p</td>
<td>-1p</td>
</tr>
</tbody>
</table>

In the end

|   | 6 | 42 |

(\textbf{Reverse})

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the end</td>
<td>6</td>
<td>42</td>
</tr>
<tr>
<td>Reverse change</td>
<td>+3p</td>
<td>+1p</td>
</tr>
</tbody>
</table>

At first

| 3u² | 3u |

(\textbf{Working})

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the end</td>
<td>18</td>
<td>42</td>
</tr>
<tr>
<td>Reverse change</td>
<td>+9p</td>
<td>+1p</td>
</tr>
</tbody>
</table>

At first

| 3u | 3u |

<table>
<thead>
<tr>
<th></th>
<th>Y</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>24</td>
<td>1p</td>
</tr>
</tbody>
</table>

There were \textbf{42} people at first.

8p = 42 − 18
= 24
1p = 24 \div 8
= 3

Y (at first) = 6 + 3p
= 6 + 3 \times 3
= 15
Z (at first) = 42 + 1p
= 42 + 3
= 45

Yvonne and Lynica had \$15 and \$45 respectively at first.
Answers to Unit 3.5

Question 6

<table>
<thead>
<tr>
<th>(Actual)</th>
<th>K</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>1u</td>
<td>4u</td>
</tr>
<tr>
<td>Change</td>
<td>−2p</td>
<td>−3p</td>
</tr>
<tr>
<td>In the end</td>
<td>12</td>
<td>108</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(Reverse)</th>
<th>K</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the end</td>
<td>12</td>
<td>108</td>
</tr>
<tr>
<td>Reverse change</td>
<td>+2p</td>
<td>+3p</td>
</tr>
<tr>
<td>At first</td>
<td>1u</td>
<td>4u</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>(Working)</th>
<th>K</th>
<th>H</th>
</tr>
</thead>
<tbody>
<tr>
<td>End</td>
<td>48</td>
<td>108</td>
</tr>
<tr>
<td>Reverse change</td>
<td>+8p</td>
<td>+3p</td>
</tr>
<tr>
<td>At first</td>
<td>4u</td>
<td>4u</td>
</tr>
</tbody>
</table>

\[
\begin{array}{c|c|c|c}
K & 48 & 5p & 3p \\
H & 48 & 60 & 3p \\
\hline
& & 108 &
\end{array}
\]

\[
5p = 108 - 48
= 60
1p = 60 ÷ 5
= 12
\]

K (spent) = 2p
\[
= 2 \times 12
= 24
\]

Kevin spent $24.

Answers to Unit 3.6

Let’s Get Started 3.6

2. Branch Diagram

- Students
  - 10u² (30u)
    - T
      - 3u³ (9u)
    - Remainder
      - 7u³ (21u)
    - A
      - 1u⁺² (7u)
    - H
      - 2u⁻² (14u)
  - 14u = 42
  - 1u = 42 ÷ 14
  - = 3
  - Total voted = 30u
  - = 30 × 3
  - = 90

Ask Yourself

1. The keywords are ‘the remaining amount’. I can use
   Branching approach to solve the question.

Let’s Practise 3.6

<table>
<thead>
<tr>
<th>Total flour</th>
<th>18u</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>550</td>
</tr>
<tr>
<td>Remainder</td>
<td>7u</td>
</tr>
<tr>
<td>G</td>
<td>4</td>
</tr>
<tr>
<td>C</td>
<td>3u</td>
</tr>
</tbody>
</table>

\[
\frac{2}{9} \text{ Total = 4u}
\]
\[
\frac{1}{9} \text{ Total = 2u}
\]
\[
\frac{4}{9} \text{ Total = 18u}
\]

Noodles = 18u − 7u
= 11u

11u = 550
1u = 550 ÷ 11
= 50
3u = 3 × 50
= 150

She used 150 g of flour to bake the cupcakes.

Let’s Get Started 3.6

2. Branch Diagram

- Students
  - 10u² (30u)
    - T
      - 3u³ (9u)
    - Remainder
      - 7u³ (21u)
    - A
      - 1u⁺² (7u)
    - H
      - 2u⁻² (14u)
  - 14u = 42
  - 1u = 42 ÷ 14
  - = 3
  - Total voted = 30u
  - = 30 × 3
  - = 90

Ask Yourself

1. The keywords are ‘the remaining amount’. I can use
   Branching approach to solve the question.

Let’s Practise 3.6

<table>
<thead>
<tr>
<th>Total bikes</th>
<th>91u</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>2u² (26u)</td>
</tr>
<tr>
<td>Remainder</td>
<td>5u³ (65u)</td>
</tr>
<tr>
<td>R</td>
<td>2u⁻³ (26u)</td>
</tr>
<tr>
<td>Rest</td>
<td>3u³ (39u)</td>
</tr>
<tr>
<td>K</td>
<td>10u³ (30u)</td>
</tr>
<tr>
<td>T</td>
<td>3u⁻³ (9u)</td>
</tr>
</tbody>
</table>

\[
\frac{2}{9} \text{ Total = 4u}
\]
\[
\frac{1}{9} \text{ Total = 2u}
\]
\[
\frac{4}{9} \text{ Total = 18u}
\]

Derrick had 70 pieces of clothing in his laundry.
Questions to Unit 3.6

Question 3 (Cont.)

\[ 30u - 26u = 4u \]
\[ 4u = 16 \]
\[ 1u = 16 \div 4 = 4 \]
\[ 9u = 9 \times 4 = 36 \]

There were 36 trick bikes.

Question 4

\[ 3u^{10} (15u) \]
\[ 2u^{10} (50u) \]
\[ 2u^{10} (20u) \]
\[ 3u^{10} (30u) \]
\[ 3u^{10} (9u) \]

Polishing Liquid

Remainder

Difference between exterior and dashboard = \[ 15u - 6u = 9u \]

9u = 0.18

1u = 0.18 \div 9 = 0.02

Amount of polish = 35u

\[ = 35 \times 0.02 \]
\[ = 0.7 \]

0.7 ℓ = 700 mℓ

The bottle contained 700 mℓ of polishing liquid at first.

Question 5

\[ 3u^{10} (75u) \]
\[ 2u^{10} (50u) \]
\[ 2u^{10} (20u) \]
\[ 3u^{10} (30u) \]
\[ 3u^{10} (9u) \]

Students

Remainder

1u^{10} (25u) P5 & P6
2u^{10} (50u) Remainder 1 5u^{10} (10u)
2u^{10} (20u) P3 & P4
3u^{10} (30u) Remainder 2 10u^{10} (30u)
P1
P2
7u^{10} (21u)

Difference = 25u - 9u

= 16u

16u = 208

1u = 208 \div 16 = 13

75u = 75 \times 13 = 975

There were 975 students at the school fun fair.

Answers to Unit 3.6

Question 6

3 cheese buns = 1 tuna bun
75 cheese buns = 25 tuna buns
3u of money = 25 tuna buns
5u of money = 75 cheese buns
1u of money = 15 cheese buns
8u of money = 8 \times 15 = 120

Donald bought 120 cheese buns.

Alternative solution

Sum of money = 25 tuna buns
1u of money = 25 \div 5

= 5 tuna buns

8u of money = 8 \times 5

= 40 tuna buns

Total cheese buns = 40 \times 3

= 120 cheese buns

Ask Yourself

1. The comparison is the number of 20-cent coins and the number of 50-cent coins; and
2. Yes. The number of coins in each group multiplies by the value of the coins.

Think Further

1. My approach will still be the same but the answer will be different.

Difference = 2.5u - 1.8u

= 0.7u

0.7u = 301

1u = 301 \div 0.7 = 430

1.8u = 1.8 \times 430

= 774

The total value of her 50-cent coins is $774.

Let's Practise 3.7

Question 1

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>\times Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>3u</td>
<td>\times 0.5</td>
<td>1.5u</td>
</tr>
<tr>
<td>L</td>
<td>2u</td>
<td>\times 1</td>
<td>2u</td>
</tr>
<tr>
<td>Total</td>
<td>5u</td>
<td></td>
<td>3.5u</td>
</tr>
</tbody>
</table>
Answers to Unit 3.7

Question 1 (Cont.)

\[
\begin{align*}
1.5u \times 2 & = 3u \\
0.5u & = 2 \\
1u & = \frac{2}{0.5} = 4 \\
3.5u & = 3.5 \times 4 = 14
\end{align*}
\]

They have $14 altogether.

Question 2

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>4u</td>
<td>×</td>
<td>1.2</td>
<td>4.8u</td>
</tr>
<tr>
<td>Y</td>
<td>2u</td>
<td>×</td>
<td>0.85</td>
<td>1.7u</td>
</tr>
<tr>
<td>Z</td>
<td>5u</td>
<td>×</td>
<td>0.6</td>
<td>3u</td>
</tr>
<tr>
<td>Total</td>
<td>11u</td>
<td></td>
<td></td>
<td>9.5u</td>
</tr>
</tbody>
</table>

11u = 451
1u = 451 ÷ 11
= 41
9.5u = 9.5 × 41
= 389.5

Sally collected $389.50 from the sales of all her seashells.

Question 3

<table>
<thead>
<tr>
<th>Late</th>
<th>On time</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>1u</td>
<td>×</td>
<td>3.25</td>
<td>3.25u</td>
</tr>
<tr>
<td>O</td>
<td>4u</td>
<td>×</td>
<td>5.25</td>
<td>21u</td>
</tr>
<tr>
<td>Total</td>
<td>5u</td>
<td></td>
<td></td>
<td>24.25u</td>
</tr>
</tbody>
</table>

24.25u = 9700
1u = 9700 ÷ 24.25
= 400
(a) 4u = 4 × 400 = 1600

1600 pizzas were delivered on time last month.

(b) No. of pizzas delivered late, 1u = 400

Difference in cost = $2
Difference in total cost = 400 × $2
= $800

Le Pizza Restaurant would have to pay $800 more if all the pizzas were delivered on time.

Question 4

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$158 tickets (sold)</td>
<td>1u</td>
<td>×</td>
<td>158</td>
<td>158u</td>
</tr>
<tr>
<td>$88 tickets (sold)</td>
<td>2u</td>
<td>×</td>
<td>88</td>
<td>176u</td>
</tr>
<tr>
<td>Total</td>
<td>3u</td>
<td></td>
<td></td>
<td>334u</td>
</tr>
</tbody>
</table>

Question 4 (Cont.)

\[
334u = 78 156
1u = 78 156 ÷ 334
= 234
3u = 3 × 234 = 702
(a) 702 tickets were sold in all.
\]

Difference = 87 636 − 78 156
= 9480
No. of another $158 tickets needed to be sold
= 9480 ÷ 158
= 60
(b) 60 more $158-ticket need to be sold to meet the targeted amount.

Question 5

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items (stickers)</th>
<th>Total value (stickers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>1u</td>
<td>×</td>
<td>6</td>
<td>6u</td>
</tr>
<tr>
<td>T</td>
<td>1u + 35</td>
<td>×</td>
<td>9</td>
<td>9u + 315</td>
</tr>
<tr>
<td>Total</td>
<td>2u + 35</td>
<td></td>
<td></td>
<td>15u + 315</td>
</tr>
</tbody>
</table>

15u = 7590 − 315
= 7275
1u = 7275 ÷ 15 = 485
(a) Sarah and her friends stamped 485 caps.

1u + 35 = 485 + 35 = 520
(b) Sarah and her friends stamped 520 T-shirts.

Question 6

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items (mooncakes)</th>
<th>Total value (mooncakes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1u + 25</td>
<td>×</td>
<td>4</td>
<td>4u + 100</td>
</tr>
<tr>
<td>C</td>
<td>1u</td>
<td>×</td>
<td>2</td>
<td>2u</td>
</tr>
<tr>
<td>Total</td>
<td>2u + 25</td>
<td></td>
<td></td>
<td>6u + 100</td>
</tr>
</tbody>
</table>

6u = 676 − 100
= 576
1u = 576 ÷ 6 = 96
2u + 25 = 2 × 96 + 25
= 217

217 people were at the celebration.

Answers to Review Questions on Chapter 3

Question 1

<table>
<thead>
<tr>
<th>L : E+S</th>
<th>E : S : E+S</th>
</tr>
</thead>
<tbody>
<tr>
<td>3^{xx}  : 7^{xx}</td>
<td>4^{yy} : 5^{yy} : 9^{yy}</td>
</tr>
<tr>
<td>27 : 63</td>
<td>28 : 35 : 63</td>
</tr>
</tbody>
</table>

Summary

<table>
<thead>
<tr>
<th>L : E : S</th>
</tr>
</thead>
<tbody>
<tr>
<td>27 : 28 : 35</td>
</tr>
</tbody>
</table>
Answers to Review Questions on Chapter 3

Question 1 (cont.)

At first                     In the end
L : E                        L : E
27 : 28                      5' : 4'
80 : 35                      28 : 

Total (end) = 35u + 28u + 35u
= 98u

98u = 588
1u = 588 ÷ 98
= 6

35u = 35 × 6
= 210

Lynette had 210 coins.

Question 2

At first                     In the end
M : S : Total               M : S : Total
8^{14} : 5^{14} : 13^{14}   : 3^{14} : 4^{14}
32 : 20 : 52               13 : 39 : 52

19u = 114
1u = 114 ÷ 19
= 6

32u = 32 × 6
= 192

Mia had $192 at first.

Question 3

T : C                        T : O
2^{15} : 3^{15}              6 : 5
6 : 9

Summary
T : C : O
6 : 9 : 5

At first                     In the end
T+C : O                     T+C : O
15 : 5                      3 : 5

Total mass = 6u + 9u + 5u
= 20u

20u = 11.2
1u = 11.2 ÷ 20
= 0.56

12u = 12 × 0.56
= 6.72

6.72 kg of vegetables were used to make the beef stew.

Question 4

G : F+W                     F : W : F+W
2^{15} : 3^{15}              4^{13} : 5^{13}
10 : 15                     3 : 12 : 15

Summary
G : F : W
10 : 3 : 12

Geetha spent = 10u – 3u
= 7u

Total (end) = 3u + 3u + 12u
= 18u
18u = 234
1u = 234 ÷ 18
= 13

7u = 7 × 13
= 91

Geetha spent $91.

Question 5

Total length of lace

\( \frac{2}{5} T + 1.2 \)

\( \frac{1}{3} \) of Remainder = 2.4 + 0.8
= 3.2

\( \frac{1}{3} \) of Remainder = 3.2 ÷ 2
= 1.6

\( \frac{2}{3} \) of Remainder = 3 × 1.6
= 4.8

\( \frac{2}{5} \) of Total = 4.8 + 1.2
= 6

\( \frac{1}{5} \) of Total = 6 ÷ 2
= 3

\( \frac{5}{5} \) of Total = 5 × 3
= 15

The seamstress had 15 m of lace at first.

Question 6

Case 1

<table>
<thead>
<tr>
<th>Ne</th>
<th>1u</th>
<th>1u</th>
<th>16</th>
<th>1u</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>1u</td>
<td>1u</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ni</td>
<td>1u</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Answers to Review Questions on Chapter 3

Question 6 (Cont.)

Case 2

\[
\begin{array}{c|c|c|c|c}
\text{Ne} & 16 & 1u & 16 & 1u \\
\hline
\text{G} & 16 & 1u & & \\
\text{Ni} & 16 & & & \\
\end{array}
\]

\[
3u = 61 - 16 = 45
\]

\[
u = 45 + 3 = 15
\]

\[
u + 16 = 15 + 16 = 31
\]

Gayle’s neighbour will always be 31 years older.

Gayle’s neighbour = 31 + 33

= 64

Gayle’s neighbour will be 64 years old when she is 33 years old.

Question 7

\[
\begin{array}{c|c|c|c|c}
\text{C} & \text{Sa+Sq} & \text{Total} & \text{Sa} & \text{C+Sq} & \text{Total} \\
\hline
3u & 16 & 7 & 1 & 17 & 5 & \\
15 & 20 & 35 & 7 & 28 & 35 & \\
\end{array}
\]

Summary

\[
\begin{array}{c|c|c|c|c}
\text{C} & \text{Sa} & \text{Sq} & \text{C} & \text{Sa} & \text{Sq} \\
\hline
15 & 7 & 13 & 1 & 13 & 13 \\
\end{array}
\]

At first

\[
\begin{array}{c|c|c|c|c}
\text{C} & \text{Sa} & \text{Sq} & \text{C} & \text{Sa} & \text{Sq} \\
\hline
15 & 7 & 13 & 1 & 13 & 13 \\
\end{array}
\]

In the end

\[
\begin{array}{c|c|c|c|c}
\text{C} & \text{Sa} & \text{Sq} & \text{C} & \text{Sa} & \text{Sq} \\
\hline
6u & 42 & & 1u & 42 + 6 & \\
& & & = 7 & 2u & 2 \times 7 \\
& & & = 14 & & \\
\end{array}
\]

14 crabstick takoyaki were sold.

Question 8

\[
\begin{array}{c|c|c|c|c}
\text{L} & \text{K} & \text{K} & \text{A} & \\
\hline
3u & 5 & 3 & 5 & \\
12 & 15 & 15 & 25 & \\
\end{array}
\]

Summary

\[
\begin{array}{c|c|c|c|c}
\text{L} & \text{K} & \text{A} & \text{L} & \text{K} & \text{A} \\
\hline
12 & 15 & 25 & & & \\
\end{array}
\]

At first

\[
\begin{array}{c|c|c|c|c}
\text{L} & \text{K} & \text{Total} & \text{L} & \text{K} & \text{Total} \\
\hline
12 & 15 & 27 & 1 & 17 & 27 \\
24 & 30 & 54 & 27 & 27 & 54 \\
\end{array}
\]

In the end

\[
\begin{array}{c|c|c|c|c}
\text{L} & \text{K} & \text{Total} & \text{L} & \text{K} & \text{Total} \\
\hline
3u & 3u & & & & \\
\end{array}
\]

Answers to Review Questions on Chapter 3

Question 8 (Cont.)

\[
3u = 12
\]

\[
u = 12 + 3
\]

= 4

Difference = 50u – 27u

= 23u

23u = 23 \times 4

= 92

Alexis had $92 more than Kyra in the end.

Answers to Unit 4.1

Let’s Get Started

1.

Average = \( \frac{115 + 36 + 280 + 41 + 9 + 1001}{6} \)

= 247

The average of the numbers is 247.

2.

Average = \( \frac{(60 \times 3) + (75 \times 12) + (85 \times 8) + (90 \times 4)}{3 + 12 + 8 + 4} \)

= \( \frac{2120}{27} \)

= 78.5 (1 d.p.)

The average mark scored by each student is 78.5.

3.

Average = \( \frac{(480 \times 5) + (495 \times 10) + (510 \times 11) + (570 \times 6) + (595 \times 2)}{5 + 10 + 11 + 6 + 2} \)

= \( \frac{17570}{34} \)

= 516.76 (2 d.p.)

The average amount of water used by each household is 516.76 litres.

Ask Yourself

1. Given the average mass, the total mass of the 3rd and 4th sculpture can be calculated after subtracting the mass of the 1st and 2nd sculptures from the total mass of the 4 sculptures.

Let’s Practise 4.1

Question 1

Total marks (4 subjects) = 65 \times 4

= 260

Total marks (English + Science) = 65 + 64

= 129

Total marks (Math + Chinese) = 260 – 120

= 131
Answers to Unit 4.1

Question 1 (Cont.)

M

\[
\begin{array}{c}
C \\
1u \\
1u
\end{array}
\]

\[131\]

2u = 131 – 5
\[= 126\]
1u = 126 ÷ 2
\[= 63\]
1u + 5 = 63 + 5
\[= 68\]
John scored 68 marks for his Science.

Question 2

Total number of hotdogs sold from 1st June to 4th June
\[= 50 \times 4\]
\[= 200\]
Total number of hotdogs sold from 5th June to 9th June
\[= 5 \times 24\]
\[= 120\]
Total number of hotdogs sold from 10th June to 20th June
\[= $240 + $2\]
\[= 120\]
Total number of hotdogs from 1st June to 20th June
\[= 200 + 120 + 120\]
\[= 440\]
Average number of hotdogs in 20 days
\[= 440 ÷ 20\]
\[= 22\]
An average of 22 hotdogs was sold from 1st of June to 20th of June.

Question 3

Total number of pens bought
\[= (3 \times 5) + (5 \times 20) + (7 \times 5) + (9 \times 10)\]
\[= 240\]
Total number of children
\[= 5 + 20 + 5 + 10\]
\[= 40\]
Average number of pens
\[= 240 ÷ 40\]
\[= 6\]
Each child bought an average of 6 pens.

Question 4

At first (Mon) \(\text{End}(\text{Fri})\)

\[
\begin{array}{c|c|c}
R & N & \text{Total} \\
\hline
3^{11} & 4^{11} & 7^{11} \\
33 & 44 & 77 \\
\hline
\end{array}
\]

No. of pages read on Friday
\[= 63u – 33u\]
\[= 30u\]
30u = 60
1u = 60 ÷ 30
\[= 2\]

77u = 77 \times 2
\[= 154\]
Average = 154 ÷ 7 = 22
John would need to read an average of 22 pages each day.

Question 5

At first (Mon) \(\text{End}(\text{Fri})\)

\[
\begin{array}{c|c|c|c|c|c|c}
S & N & \text{Total} & S & N & \text{Total} \\
\hline
3^{19} & 5^{19} & 8u^{19} & 8^{18} & 1^{18} & 9u^{18} \\
27 & 45 & 72u & 64 & 8 & 72u \\
\hline
\end{array}
\]

Apples sold in the next 3 days
\[= 64u – 27u\]
\[= 37u\]
37u = 111
1u = 111 ÷ 37
\[= 3\]
72u = 72 ÷ 3
\[= 216\]
Average = 216 ÷ 9
\[= 24\]
Belle sold an average of 24 apples each day.

Question 6

Total score of 23 students
\[= 23 \times 76.5\]
\[= 1759.5\]
Total score of next 2 highest score
\[= 2 \times 82.25\]
\[= 164.5\]
Total score of the top 3 highest scores
\[= 95 + 164.5\]
\[= 259.5\]
Total score of 20 students
\[= 1759.5 – 259.5\]
\[= 1500\]
Average score of the remaining students
\[= 1500 ÷ 20\]
\[= 75\]
(a) The average score of the remaining students is 75.
New average score
\[= 76.5 + 0.5 = 77\]
New total score
\[= 77 \times 24 = 1848\]
New score
\[= 1848 – 1759.5 = 88.5\]
(b) The new student’s score is 88.5.

Answers to Unit 4.2

Let’s Get Started

(a) Number of girls  Average Total
\[\begin{array}{c|c|c}
\text{Before} & 6 & 8 & 6 \times 8 = 48 \\
\text{After} & 7 & 9 & 7 \times 9 = 63 \\
\hline
\end{array}\]

(b) The increase in the number of girls by 1.

Ask Yourself

In this question, the number of girls in the group is unknown.
Let’s Practise 4.2

Question 1

<table>
<thead>
<tr>
<th></th>
<th>Number of students</th>
<th>Average amount collected ($)</th>
<th>Total amount collected ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>1u</td>
<td>125</td>
<td>125u</td>
</tr>
<tr>
<td>After</td>
<td>1u + 15</td>
<td>113</td>
<td>113u + 1695</td>
</tr>
</tbody>
</table>

12u = 1695 – 1275
= 420
1u = 420 ÷ 12
= 35
1u + 15 = 35 + 15
= 50

There were 50 students in a group.

Question 2

<table>
<thead>
<tr>
<th></th>
<th>Number of days</th>
<th>Average number of pages read</th>
<th>Total number of pages read</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>1u</td>
<td>15</td>
<td>15u</td>
</tr>
<tr>
<td>After</td>
<td>1u + 4</td>
<td>17</td>
<td>17u + 68</td>
</tr>
</tbody>
</table>

2u = 88 – 68
= 20
1u = 20 ÷ 2
= 10

Days read in all = 1u + 4
= 10 + 4
= 14

John read for 14 days in all altogether.

Question 3

Method 1

<table>
<thead>
<tr>
<th></th>
<th>Number of babies</th>
<th>Average mass (kg)</th>
<th>Total mass (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>1u</td>
<td>3.2</td>
<td>3.2u</td>
</tr>
<tr>
<td>After</td>
<td>1u + 1</td>
<td>3.4</td>
<td>3.4u + 3.4</td>
</tr>
</tbody>
</table>

3.4u – 3.2u = 0.2u
0.2u = 5.8 – 3.4
= 2.4
1u = 2.4 ÷ 0.2
= 12

There were 12 babies in the nursery.

Answers to Unit 4.2

Question 3 (Cont.)

Method 2

Difference in mass of the new baby = 5.8 – 3.4
= 2.4

Average change with the new baby = 3.4 – 3.2
= 0.2

Number of babies = 2.4 ÷ 0.2
= 12

There were 12 babies in the nursery.

Question 4

Method 1

<table>
<thead>
<tr>
<th></th>
<th>Number of pairs of chopsticks</th>
<th>Average price ($)</th>
<th>Total price ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>1u</td>
<td>12.5</td>
<td>12.5u</td>
</tr>
<tr>
<td>After</td>
<td>1u + 2</td>
<td>15.75</td>
<td>15.75u + 31.5</td>
</tr>
</tbody>
</table>

3.25u = 51 – 31.5
= 19.5
1u = 19.5 ÷ 3.25
= 6

Nisa bought 6 pairs of stainless steel chopsticks for her friends.

Method 2

Difference in the cost of 1 pair of silver and 1 pair of gold-plated chopsticks = ($16 + $35) – ($15.75 × 2)
= $19.50

Average change = $15.75 – $12.50
= $3.25

Number of stainless steel chopsticks bought = $19.50 ÷ $3.25
= 6

Nisa bought 6 pairs of stainless steel chopsticks for her friends.

Question 5

<table>
<thead>
<tr>
<th></th>
<th>Number of friends</th>
<th>Average points</th>
<th>Total points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before</td>
<td>1u + 1</td>
<td>38</td>
<td>38u + 38</td>
</tr>
<tr>
<td>After</td>
<td>1u</td>
<td>36</td>
<td>36u</td>
</tr>
</tbody>
</table>

2u = 48 – 38
= 10
1u = 10 ÷ 2
= 5

5 of Jennifer’s friends took part in the quiz.
Answers to Unit 4.2

Question 6

<table>
<thead>
<tr>
<th>Number of people</th>
<th>Average marks</th>
<th>Total marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>90</td>
<td>90u</td>
</tr>
<tr>
<td>C2</td>
<td>87</td>
<td>87u</td>
</tr>
</tbody>
</table>

Difference = 90u – 87u = 3u
Gap = 5 + 13 = 18
3u = 18
1u = 18 ÷ 3 = 6
6 – 1 = 5
Harith has 5 friends.

Answers to Unit 4.3

Let’s Get Started

1. Total seashells of M and K = 8 × 2 = 16

<table>
<thead>
<tr>
<th>M</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>K</td>
</tr>
</tbody>
</table>

   Difference = 16 – 12 = 4
   (a) Kim had 4 more seashells than Lisa.
   Number of seashells Kim had = 7 + 4 = 11
   (b) Kim had 11 seashells.

2. Total number of cars of D and M = 20 × 2 = 40
Total number of cars of D, M and K = 19 × 3 = 57
Number of cars Keith had = 57 – 40 = 17
(a) Keith had 17 toy cars.

<table>
<thead>
<tr>
<th>M</th>
<th>1u</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>1u</td>
<td></td>
</tr>
</tbody>
</table>

2u = 40 – 4 = 36
1u = 36 ÷ 2 = 18
(b) Danny had 18 toy cars.

Answers to Unit 4.3

Ask Yourself
1. The repeated items are Louisa and Fanny.

Let’s Practise 4.3

Question 1

<table>
<thead>
<tr>
<th>Average score (points)</th>
<th>Total score (points)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S + M</td>
<td>77</td>
</tr>
<tr>
<td>R + M</td>
<td>71.5</td>
</tr>
<tr>
<td>S + M + A</td>
<td>73</td>
</tr>
<tr>
<td>A + R</td>
<td>69</td>
</tr>
</tbody>
</table>

Ada’s score = 219 – 154 = 65
Risa’s score = 138 – 65 = 73
Mayo’s score = 143 – 73 = 70
Sally’s score = 154 – 70 = 84
Sally, Mayo, Ada and Risa scored 84 points, 70 points, 65 points and 73 points respectively.

Question 2

Total tags (D + C) = 203 × 2 = 406
Total tags (E + C) = 194 × 2 = 388
Total tags (E + D) = 181 × 2 = 362
Total tags (2D + 2C + 2E) = 406 + 388 + 362 = 1156
Total tags (D + C + E) = 1156 ÷ 2 = 578
E = 578 – 406 = 172
C = 388 – 172 = 216
D = 362 – 172 = 190
Dave, Cherrie and Elaine had 190 tags, 216 tags and 172 tags respectively.

Question 3

Total number of perfume bottles collected = 4 × 25 = 100
(3 × 3) + (2 × 8) + 15 = 40
Answers to Unit 4.3

Question 3 (Cont.)

\[ 4u = 100 - 40 \]
\[ = 60 \]
\[ 1u = 60 ÷ 4 \]
\[ = 15 \]

Total number of perfume bottles collect by R+E+H
\[ = 3u + 14 \]
\[ = 3 \times 15 + 14 \]
\[ = 59 \]

Average number of perfume bottles collect by R+E+H
\[ = 59 ÷ 3 \]
\[ = 19 \frac{2}{3} \]
\[ ≈ 20 \] (nearest whole number)

The average number of perfume bottles collect by Rachel, Eileen and Henna is 20.

Question 4

Total number of door knobs produced by A and B weekly
\[ = 3486 \times 2 \]
\[ = 6972 \]

Total number of door knobs produced by A and C weekly
\[ = 6586 \times 2 \]
\[ = 13172 \]

Difference in the number of door knobs produced between B and C weekly
\[ = 13172 - 6972 \]
\[ = 6200 \]

Difference in units between B and C
\[ = 7u - 2u \]
\[ = 5u \]

5u = 6200
\[ 1u = 6200 ÷ 5 \]
\[ = 1240 \]

2u = 2 \times 1240
\[ = 2480 \] (Factory B)

Factory A = 6972 – 2480
\[ = 4492 \]

Factory A produces 4492 door knobs weekly.

Question 5

Total number of stones J and R had
\[ = 105 \times 2 \]
\[ = 210 \]

Total number of stones J and D had
\[ = 67.5 \times 2 \]
\[ = 135 \]

Difference between R and D
\[ = 210 - 135 \]
\[ = 75 \]

Difference in units between R and D
\[ = 5u - 2u \]
\[ = 3u \]

3u = 75
\[ 1u = 75 ÷ 3 \]
\[ = 25 \]

2u = 2 \times 25
\[ = 50 \] (Darren)

Number of stones Jason had
\[ = 135 - 50 \]
\[ = 85 \]

Jason had 85 stones.

Question 6

<table>
<thead>
<tr>
<th>End</th>
<th>Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>5A :</td>
<td>5B :</td>
</tr>
<tr>
<td>1(\frac{1}{2}) :</td>
<td>2(\frac{1}{2}) :</td>
</tr>
<tr>
<td>4 :</td>
<td>2 :</td>
</tr>
<tr>
<td>2 :</td>
<td>4 :</td>
</tr>
</tbody>
</table>

Total number of candies at first = 225 \times 3
\[ = 675 \]

Total number of candies in the end = 45 \times 3
\[ = 135 \]

Total number of candies sold = 675 – 135
\[ = 540 \]

Total candies sold (units) = 2u + 4u + 3u
\[ = 9u \]

9u = 540
\[ 1u = 540 ÷ 9 \]
\[ = 60 \]

Total number of candies sold by Class 5A and 5C
\[ = 2u + 3u \]
\[ = 5u \]

5u = 5 \times 60
\[ = 300 \]

Class 5A and Class 5C sold 300 candies altogether.

Answers to Unit 5.1

Let’s Get Started

1. Using the property that the sum of angles on a straight line is 180°,
\[ \angle y = 180° - 112° \]
\[ = 68° \].

2. Using the property that vertically opposite angles between straight lines are equal (or the same),
\[ \angle p = 46° \], and
\[ \angle q = 39° \].

Ask Yourself

1. The sum of angles on a straight line is 180°.

Think Further

1. From the given ratios, \( \angle c \) is the repeated item/subject.

Hence, form a relationship between the two sets of ratios where the ratio representing \( \angle c \) is made the same in both ratios.

\[
\begin{align*}
\angle a : \angle c & : \angle b : \angle c \\
2:1 & : 3 : 2 \\
4 : 2 & : 3 \\
\end{align*}
\]

Summary

\[
\begin{align*}
\angle a : \angle c & : \angle b \\
4 : 2 & : 3 \\
\end{align*}
\]
Answers to Unit 5.1

Let’s Practise 5.1

Question 1

Using the property that the sum of angles on a straight line is 180°,
\[ \angle a + \angle b + 120^\circ = 180^\circ \]
\[ \angle a + \angle b = 180^\circ - 120^\circ = 60^\circ \]
6u = 60°
1u = 60° ÷ 6
= 10°
\[ \angle a = 4u = 4 \times 10^\circ = 40^\circ \]
\[ \angle b = 2u = 2 \times 10^\circ = 20^\circ \]

Question 2

Using the property that the sum of angles on a straight line is 180°,
\[ \angle m + \angle n + 90^\circ = 180^\circ \]
\[ \angle m + \angle n = 180^\circ - 90^\circ = 90^\circ \]
5u = 90°
1u = 90° ÷ 5
= 18°
\[ \angle m = 2u = 18^\circ \times 2 = 36^\circ \]
\[ \angle n = 3u = 18^\circ \times 3 = 54^\circ \]

Question 3

Using the property of vertically opposite angles,
\[ \angle a + \angle b = 126^\circ \]
3u = 126°
1u = 126° ÷ 3
= 42°
\[ \angle a = 2u = 42^\circ \times 2 = 84^\circ \]
\[ \angle b = 42^\circ \]

Question 4

Using the property of vertically opposite angles,
\[ \angle m + \angle n + 40^\circ = 135^\circ \]
\[ \angle m + \angle n = 135^\circ - 40^\circ = 95^\circ \]
5u = 95°
1u = 95° ÷ 5
= 19°

Question 4 (Cont.)
\[ \angle m = 19^\circ \times 3 = 57^\circ \]
\[ \angle n = 19^\circ \times 2 = 38^\circ \]

Question 5

Using the property of vertically opposite angles,
\[ \angle a = 88^\circ \]
\[ \angle b = 88^\circ ÷ 2 = 44^\circ \] (given: half that of \( \angle a \))
\[ \angle a + \angle b = 88^\circ + 44^\circ = 132^\circ \]

Using the property that the sum of angles on a straight line is 180°,
\[ \angle a + \angle b + \angle c = 180^\circ \]
\[ \angle c = 180^\circ - 132^\circ = 48^\circ \]

Question 6
\[ \angle XNY = 115^\circ \] (Vertically opposite angles)
\[ \angle a = 180^\circ - 115^\circ - 42.5^\circ = 22.5^\circ \] (Sum of angles in a triangle)
\[ \angle b = 92.5^\circ \] (Exterior angles)
\[ \angle MKY = 180^\circ - 45^\circ - 92.5^\circ = 42.5^\circ \] (Angles on a straight line)
\[ \angle c = 115^\circ + 42.5^\circ = 157.5^\circ \] (Exterior Angles)

Answers to Unit 5.2

Let’s Get Started

Question 1
(a) There are two pairs of parallel lines i.e. AB // CD and AC // BD.
(b) \( \angle ACD = \angle ADB \) and \( \angle BAC = \angle CDB \)
(c) \( \angle BAC + \angle ACD = 180^\circ, \angle ABD + \angle CDB = 180^\circ, \angle CAB + \angle ABD = 180^\circ \) and \( \angle BDC + \angle DCA = 180^\circ \).

Question 2
(a) There are two pairs of parallel lines i.e. AB // DC and AD // BC.
(b) \( \angle ABC = \angle ADC \) and \( \angle BAD = \angle BCD \)
(c) \( \angle BAD + \angle ABC = 180^\circ, \angle ABC + \angle BCD = 180^\circ, \angle BCD + \angle ADC = 180^\circ \) and \( \angle DCA + \angle DAB = 180^\circ \).

Question 3
(a) There is a pair of parallel lines i.e. CD // BA.
(b) There are no angles that are the same.
(c) \( \angle ADC + \angle BAD = 180^\circ \) and \( \angle DCB + \angle ABC = 180^\circ \)
Answers to Unit 5.2

Question 4
Using the property that the sum of interior angles between a pair of parallel lines add up to 180°,
\[ \angle SPR + 37° = 180° \]
\[ \angle SPR = 180° - 37° = 143° \]

Using the property of the sum of angles at a point is 360°,
\[ \angle QRS + 143° + 68° = 360° \]
\[ 143° + 68° = 211° \]
\[ \angle QRS = 360° - 211° = 149° \]

Using the property that the sum of interior angles between a pair of parallel lines add up to 180°,
\[ \angle k + \angle QRS = 180° \]
\[ \angle k + 149° = 180° \]
\[ \angle k = 180° - 149° = 31° \]

Question 5
Using the property that the sum of angles on a straight line is 180°,
\[ \angle a + 52° + 55° = 180° \]
\[ 55° + 52° = 107° \]
\[ \angle a = 180° - 107° = 73° \]

Method 1
\[ \angle a + 52° + \angle c = 180° \] (Internal angles)
\[ 73° + 52° + \angle c = 180° \]
\[ 73° + 52° = 125° \]
\[ \angle c = 180° - 125° = 55° \]

Method 2
Using the property of corresponding angles,
\[ \angle c = 55° \]

Using the property that the sum of angles in a triangle is 180°,
\[ \angle b + 55° + 73° = 180° \]
\[ 55° + 73° = 128° \]
\[ \angle b = 180° - 128° = 52° \]

Question 6
Using the property that the sum of interior angles between a pair of parallel lines add up to 180°,
\[ 107° + \angle BCD = 180° \]
\[ \angle BCD = 180° - 107° = 73° \]
\[ \angle DCF = 73° \]
\[ \angle n = 180° - 73° = 107° \] (Interior Angles)

Using the property that the sum of angles on a straight line is 180°,
\[ \angle n + \angle m = 180° \]
\[ \angle m = 180° - 107° = 73° \]

Answers to Unit 5.2

Ask Yourself
1. Sum of angles on a straight line. Yes, we can find the angle directly.
2. Sum of angles in a triangle.
3. The base angles in an isosceles triangle are the same.

Let’s Practise 5.2

Question 1
Using the property that the line BD is a diagonal to Square ABCD, it cuts the angles at the corners in half.
(a) \( \angle CBD = 45° \)
\[ \angle BDC = 45° \]
\[ \angle CBD = \angle BDC = 45° \]
\[ \angle CBD : \angle BDC = 1 : 1 \]
(b) The ratio is 1 : 1.

Question 2
Using the property that the sum of angles on a straight line is 180°,
\[ \angle BED + 65° = 180° \]
\[ \angle BED = 180° - 65° = 115° \]

Using the property that Triangle BED is an isosceles triangle and that the sum of angles in a triangle is 180°,
\[ \angle DBE = \angle EDB \]
\[ \angle DBE = \frac{180° - 115°}{2} \]
\[ = 32.5° \]

Question 3
Using the property that the sum of angles in a triangle is 180°,
\[ \angle ECH + 70° + 90° = 180° \]
\[ 70° + 90° = 160° \]
\[ \angle ECH = 180° - 160° = 20° \]

Using the property that the line BD is a diagonal to Square ABCD, it cuts the angles at the corners in half.
\[ \angle ACD = 45° \]
\[ \angle ACD = 45° - 20° \]
\[ = 25° \]

Question 4
Using the property that the sum of angles on a straight line is 180°,
\[ \angle HED = 180° - 60° = 120° \]
\[ \angle HDE = 45° \]
\[ \angle DHE = 180° - 120° - 45° = 15° \]
Answers to Unit 5.2

Question 4 (Cont.)

\[ \angle BHC = 180^\circ - 90^\circ - 45^\circ - 15^\circ = 30^\circ \]
\[ \angle HBC = \frac{180^\circ - 30^\circ}{2} = 75^\circ \]

Question 5

Using the property that Triangle BDF is an isosceles triangle and that the sum of angles in a triangle is 180°,
\[ \angle BDF + \angle BDF + 30^\circ = 180^\circ \]
\[ \angle BDF = \frac{180^\circ - 30^\circ}{2} = 75^\circ \]

Using the property that the sum of angles in a triangle is 180°,
\[ \angle ADE + 40^\circ + 90^\circ = 180^\circ \]
\[ 40^\circ + 90^\circ + 50^\circ = 180^\circ \]
\[ \angle ADE = 180^\circ - 130^\circ = 50^\circ \]

Using the property that the sum of angles on a straight line is 180°,
\[ \angle BDC + 50^\circ + 75^\circ = 180^\circ \]
\[ 50^\circ + 75^\circ = 125^\circ \]
\[ \angle BDC = 180^\circ - 125^\circ = 55^\circ \]

Using the property that the sum of angles in a triangle is 180°,
\[ \angle BDC + 55^\circ + 90^\circ = 180^\circ \]
\[ 55^\circ + 90^\circ = 145^\circ \]
\[ \angle BDC = 180^\circ - 145^\circ = 35^\circ \]

Question 6

Using the property that the sum of angles in a triangle is 180°,
\[ \angle CFD + 65^\circ + 90^\circ = 180^\circ \]
\[ 65^\circ + 90^\circ = 155^\circ \]
\[ \angle CFD = 180^\circ - 155^\circ = 25^\circ \]

Using the property that the line BF is a diagonal to Square ABEF, it cuts the angles at the corners in half.
\[ \angle BFC = \frac{25^\circ}{2} = 45^\circ \]
\[ \angle BFC = 45^\circ - 25^\circ = 20^\circ \]

Question 7

Since ABCD is a rhombus, the line BD cuts the rhombus into half such that Triangle BCD and Triangle ABD becomes isosceles triangles where BC = CD and AB = AD respectively.

\[ \angle DBC = \frac{180^\circ - 45^\circ}{2} = 67.5^\circ \]
\[ \angle EDB = 67.5^\circ - 30^\circ = 37.5^\circ \]

Question 8

\[ \angle EBC = 31^\circ + 56^\circ = 87^\circ \]

Question 9

\[ \angle EBC = 55^\circ \] (Corresponding angles)
\[ \angle DEA = \angle EBC = 55^\circ \] (Triangle ADE and Triangle BEC are identical)
\[ \angle AEB = 180^\circ - 55^\circ - 55^\circ = 70^\circ \]

Question 10

Using the property that opposite angles in a parallelogram are equal.
\[ \angle AEC = 75^\circ \]
\[ (a) \angle AED = 180^\circ - 75^\circ = 105^\circ \]
\[ \angle AEF = 35^\circ \] (Alternate angles)
\[ (b) \angle FEC = 75^\circ - 35^\circ = 40^\circ \]

Question 11

Since BCDE is a rhombus, the line BD cuts the rhombus into half such that Triangle BCD and Triangle BED becomes isosceles triangles where BC = CD and BE = DE respectively.

Since Triangle BCD is an equilateral triangle,
\[ (a) \angle CDB = 60^\circ \]
Since AF = AE, ABEF and BCDE are identical rhombuses,
\[ \angle BAE = 60^\circ \]
\[ (b) \angle EAK = 60^\circ - 50^\circ = 10^\circ \]

Question 12

\[ \angle EFC = 180^\circ - 50^\circ = 130^\circ \] (Interior angles)
\[ \angle GFA = 130^\circ \] (Vertically opposite angles)
Question 12 (Cont.)

\[ \angle AGF = \frac{180^\circ - 130^\circ}{2} = 25^\circ \]

(Sum of angles in an isosceles triangle)

\[ \angle GHB = 180^\circ - 25^\circ - 78^\circ = 77^\circ \]

(Sum of angles in a triangle)

Question 13

Using the property that the sum of angles in isosceles triangle is 180°,

\[ \angle ACB = 180^\circ - 60^\circ = 120^\circ \]

Using the property of vertically opposite angles,

\[ \angle DCE = \angle CED = \frac{180^\circ - 120^\circ}{2} = 30^\circ \]

Question 14

Using the property that the sum of interior angles between a pair of parallel lines add up to 180°,

\[ \angle ACD = 180^\circ - 72^\circ = 108^\circ \]

Using the property that the sum of angles in a triangle is 180°,

\[ \angle ADC = 180^\circ - 133^\circ = 47^\circ \]

\[ \angle CAB = 180^\circ - 78^\circ \times 2 = 24^\circ \]

\[ \angle GAD = 180^\circ - 24^\circ - 78^\circ - 25^\circ = 53^\circ \]

(Interior angles)

Question 15

Using the property that the sum of angles in a triangle is 180° and Triangle BGF is an isosceles triangle,

\[ \angle BFG = \angle BGF = \frac{180^\circ - 24^\circ}{2} = 78^\circ \]

Using the property that the sum of angles on a straight line is 180°,

\[ 78^\circ + 39^\circ + 49^\circ = 166^\circ \]

\[ \angle CFD = 180^\circ - 166^\circ = 14^\circ \]

\[ \angle CDE = 63^\circ \] (Corresponding angles)

\[ \angle DCF = 180^\circ - 63^\circ = 117^\circ \] (Interior angles)

Answers to Unit 6.1

1. Height: AB
2. Base: AB; Height: CD
3. Base: AB; Height: GF
4. Area of A = \( \frac{1}{2} \times 4 \text{ cm} \times 3 \text{ cm} = 6 \text{ cm}^2 \)
   Area of B = \( \frac{1}{2} \times 6 \text{ cm} \times 1 \text{ cm} = 3 \text{ cm}^2 \)
   Area of C = \( \frac{1}{2} \times 2 \text{ cm} \times 4 \text{ cm} = 4 \text{ cm}^2 \)
5. (a) Area of the shaded triangle
   \[ = \frac{1}{2} \times 6 \text{ cm} \times 5 \text{ cm} = 15 \text{ cm}^2 \]
   (b) Area of the shaded triangle
   \[ = \frac{1}{2} \times 5 \text{ cm} \times 6 \text{ cm} = 15 \text{ cm}^2 \]

Let’s Get Started 6.1

2. (a) Method 1
   Area of Triangle A = \( \frac{1}{2} \times 22 \text{ cm} \times 20 \text{ cm} \)
   \[ = 220 \text{ cm}^2 \]
   Area of Triangle B = \( \frac{1}{2} \times 22 \text{ cm} \times 30 \text{ cm} \)
   \[ = 330 \text{ cm}^2 \]
   Total area of Triangles A and B
   \[ = 220 \text{ cm}^2 + 330 \text{ cm}^2 = 550 \text{ cm}^2 \]

Method 2
   Total area = \( \frac{1}{2} \times 22 \text{ cm} \times 50 \text{ cm} \)
   \[ = 550 \text{ cm}^2 \]
   (b) No. The area of the shaded parts in both rectangles is the same since they have the same base and height.
Answers to Unit 6.1

3. Area of the shaded part = \( \frac{1}{2} \times 10 \text{ cm} \times 5 \text{ cm} = 25 \text{ cm}^2 \)

   OR
   \[ \frac{1}{2} \times \text{common base} \times \text{combined height} \]
   \[ = \frac{1}{2} \times 5 \text{ cm} \times 10 \text{ cm} \]
   \[ = 25 \text{ cm}^2 \]

4. Area of Triangle ABC = \( \frac{1}{2} \times 20 \text{ cm} \times (25 - 12) \text{ cm} \)
   \[ = 130 \text{ cm}^2 \]

   Area of Triangle ABD = \( \frac{1}{2} \times 20 \text{ cm} \times 25 \text{ cm} \)
   \[ = 250 \text{ cm}^2 \]

   Ratio = 130 : 250 = 13 : 25

(Notice that the ratio of the two areas of triangles sharing a common base is actually the same as the ratio of its height.)

5. Area of the shaded triangles
   \[ = \frac{1}{2} \times 12 \text{ cm} \times (14 - 5) \text{ cm} + \frac{1}{2} \times 12 \text{ cm} \times (10 - 5) \text{ cm} \]
   \[ = 84 \text{ cm}^2 \]

Ask Yourself

1. The height of both triangles are the same.

Let’s Practise 6.1

Question 1

Total area of the unshaded triangles
\[ = \frac{1}{2} \times 20 \text{ cm} \times 10 \text{ cm} \]
\[ = 100 \text{ cm}^2 \]

Question 2

Total area of the unshaded triangles
\[ = \frac{1}{2} \times 24 \text{ cm} \times 18 \text{ cm} \]
\[ = 216 \text{ cm}^2 \]

Question 3

Total area of the shaded triangles
\[ = \frac{1}{2} \times (9 + 7 + 3) \text{ cm} \times 6 \text{ cm} \]
\[ = 57 \text{ cm}^2 \]

Question 4

Total area of the 3 shaded triangles
\[ = \frac{1}{2} \times (15 + 2) \text{ cm} \times 18 \text{ cm} \]
\[ = 153 \text{ cm}^2 \]

Question 5

Total area of the shaded triangles
\[ = \frac{1}{2} \times 20 \text{ cm} \times (10 + 5) \text{ cm} \]
\[ = 150 \text{ cm}^2 \]

Answers to Unit 6.1

Question 6

Total area of the shaded triangles
\[ = \frac{1}{2} \times 32 \text{ cm} \times 28 \text{ cm} \]
\[ = 448 \text{ cm}^2 \]

Question 7

Total area of the shaded triangles
\[ = \frac{1}{2} \times (10 + 15) \text{ cm} \times 20 \text{ cm} \]
\[ = 250 \text{ cm}^2 \]

Question 8

Total area of the unshaded triangles
\[ = \frac{1}{2} \times 15 \text{ cm} \times (48 + 9) \text{ cm} \]
\[ = 427.5 \text{ cm}^2 \]

Question 9

Total area of the shaded triangles
\[ = \frac{1}{2} \times (10 + 8) \text{ cm} \times 20 \text{ cm} \]
\[ = 180 \text{ cm}^2 \]

Question 10

Total area of the unshaded parts of the figure
\[ = (11 + 20) \text{ cm} \times 18 \text{ cm} - \frac{1}{2} \times 20 \text{ cm} \times 18 \text{ cm} \]
\[ = 378 \text{ cm}^2 \]

Question 11

Total area of the shaded parts
\[ = \frac{1}{2} \times 30 \text{ cm} \times (30 + 10) \text{ cm} \]
\[ = 600 \text{ cm}^2 \]

Question 12

Length of the rectangle, FD = \[ \frac{1323 \times 2}{42} \]
\[ = 63 \text{ cm} \]

BC = \( \frac{2}{3} \times 63 \text{ cm} \)
\[ = 18 \text{ cm} \]

ED = \( 18 \text{ cm} - 10 \text{ cm} \)
\[ = 8 \text{ cm} \]

Total area of the unshaded triangles
\[ = \frac{1}{2} \times 18 \text{ cm} \times 23 \text{ cm} + \frac{1}{2} \times 8 \text{ cm} \times 19 \text{ cm} \]
\[ = 283 \text{ cm}^2 \]

Question 13

Total area of the shaded parts
\[ = \frac{1}{2} \times (26 + 26) \text{ cm} \times 26 \text{ cm} \]
\[ = 676 \text{ cm}^2 \]
Answers to Unit 6.1

Question 14
Area of A = Area of B + C
Area of A = \( \frac{1}{2} \times 18 \text{ cm} + 18 \text{ cm} \)
= 162 cm²
Area of D + C = \( \frac{1}{2} \times (18 + 18) \text{ cm} \times 18 \text{ cm} \)
= 324 cm²
Total area of the shaded parts = 2 × 162 cm² + 324 cm²
= 648 cm²

Answers to Unit 6.1

Answers to Unit 6.2

Let’s Get Started 6.2

1. Area of the square
   \( = 2 \times \frac{1}{2} \times 48 \text{ cm} \times 48 \div 2 \text{ cm} \)
   = 1152 cm²

2. Height of each identical triangle = 20 ÷ 2
   = 10
   Area of figure = \( 8 \times \frac{1}{2} \times 9 \text{ cm} \times 10 \text{ cm} \)
   = 360 cm²

3. Area of figure = \( 5 \times \frac{1}{2} \times 18 \text{ cm} \times 10 \text{ cm} \)
   = 450 cm²

Ask Yourself
1. The sum of the 3 triangles on each side of diagonal line is the same.

Think Further
1. If the figure is made up of 6 identical triangles, then the area of Triangle F would be found using the formula:
\( \frac{1}{2} \times \text{base length} \times \text{height} \)

Let’s Practise 6.2

Question 1

Area of Figure = 24 cm × 24 cm
= 576 cm²
Area of the Triangle A = \( \frac{1}{2} \times 24 \text{ cm} \times 6 \text{ cm} \)
= 72 cm²
Area of the Triangle B = \( \frac{1}{2} \times 18 \text{ cm} \times 6 \text{ cm} \)
= 54 cm²

Answers to Unit 6.2

Question 1 (Cont.)
Area of the Triangle C = \( \frac{1}{2} \times 12 \text{ cm} \times 6 \text{ cm} \)
= 36 cm²
Area of Triangle D is the same as Area of Triangle A
= 72 cm²
Area of shaded area
= 576 cm² – 72 cm² – 54 cm² – 36 cm² – 72 cm²
= 324 cm²

Question 2
Area of shaded Triangle A
= \( \frac{1}{2} \times 6 \text{ cm} \times (12 – 5) \text{ cm} \)
= 21 cm²
Area of shaded Triangle B
= \( \frac{1}{2} \times 11 \text{ cm} \times 12 \text{ cm} + \frac{1}{2} \times 11 \text{ cm} \times 8 \text{ cm} \)
= 110 cm²

Question 3
Total units = 4u + 3u + 2u
= 9u
9u = 36 cm
1u = 36 cm ÷ 9
= 4 cm
AH = 4 × 4 cm
= 16 cm
HG = 3 × 4 cm
= 12 cm
GF = 2 × 4 cm
= 8 cm
Total area of Triangle ABH and Triangle BHC
= \( \frac{1}{2} \times 16 \text{ cm} \times 10 \text{ cm} \)
= 80 cm²
Area of Triangle BCH and Triangle DCE
= \( \frac{1}{2} \times 12 \text{ cm} \times 10 \text{ cm} \)
= 60 cm²
Area of Triangle EGF = \( \frac{1}{2} \times 8 \text{ cm} \times 10 \text{ cm} \)
= 40 cm²
Area of the figure
= 80 cm² + 60 cm² + 40 cm² + 110 cm²
= 290 cm²

Question 4
\[
\begin{array}{ccc}
AB : & EF : & CD : \\
1 : 3 & : 2 & : 3 \\
3 & : & 6 \\
\hline
\end{array}
\]
Summary ratio
\[
\begin{array}{ccc}
AB : & EF : & CD \\
3 & : & 6 \\
\hline
\end{array}
\]
Difference = 6u – 2u = 4u
Question 4 (Cont.)

\[ 4u = 12 \text{ cm} \]
\[ 1u = 12 \text{ cm} \div 4 = 3 \text{ cm} \]
\[ AB = 3 \times 3 \text{ cm} = 9 \text{ cm} \]

Area of figure = \[ \frac{1}{2} \times 10 \text{ cm} \times (9 + 12) \text{ cm} = 105 \text{ cm}^2 \]

Alternative solution by Richard

Area of Triangle AEH = \[ \frac{1}{2} \times 10 \text{ cm} \times 9 \text{ cm} = 45 \text{ cm}^2 \]
Area of Triangle EGC = \[ \frac{1}{2} \times 10 \text{ cm} \times (18 \text{ cm} - 6 \text{ cm}) = 60 \text{ cm}^2 \]

Area of figure = \[ 45 \text{ cm}^2 + 60 \text{ cm}^2 = 105 \text{ cm}^2 \]

Question 5

\[ AB = \frac{3}{8} \times 200 \text{ m} = 75 \text{ m} \]

(a) Cost of building the picnic area
\[ = 75 \text{ m} \times 75 \text{ m} \times $20 \]
\[ = $112,500 \]

(b) Cost of fencing the fountain
\[ = (250 \text{ m} + 150 \text{ m} + 200 \text{ m}) \times $12 \]
\[ = $7200 \]

Question 6

Area of square = \[ 20 \text{ m} \times 20 \text{ m} = 400 \text{ m}^2 \]
Area of A = \[ 400 \text{ m}^2 - \frac{1}{2} \times 20 \text{ m} \times (20 - 7) \text{ m}^2 = 270 \text{ m}^2 \]
Area of C = \[ \frac{1}{2} \times 20 \text{ m} \times (15 - 13) \text{ m} = 20 \text{ m}^2 \]

Difference = \[ 270 \text{ m}^2 - 20 \text{ m}^2 = 250 \text{ m}^2 \]

Question 7

Base length of Triangle B and Triangle C
\[ = 70 \text{ m} \times 2 \div 7 \text{ m} = 20 \text{ m} \]
Area of A = \[ 28 \text{ m} \times 20 \text{ m} - 70 \text{ m}^2 = 490 \text{ m}^2 \]
Area of D = \[ \frac{1}{2} \times (28\text{m} - 21 \text{ m}) \times 8 \text{ m} = 28 \text{ m}^2 \]

Sum of areas of A and D = \[ 490 \text{ m}^2 + 28 \text{ m}^2 = 518 \text{ m}^2 \]

Question 8

Area of Rectangle FBCD = \[ 2 \times 52 \text{ cm}^2 = 104 \text{ cm}^2 \]
Area of Triangle ABF = \[ \frac{1}{2} \times 52 \text{ cm}^2 = 26 \text{ cm}^2 \]

Area of Triangle FDE = \[ 52 \text{ cm}^2 \]

Area of figure = \[ 104 \text{ cm}^2 + 52 \text{ cm}^2 + 26 \text{ cm}^2 = 182 \text{ cm}^2 \]

Question 9

Area of the entire figure = \[ 3 \times 100 \text{ cm}^2 = 300 \text{ cm}^2 \]

Question 10

Height of shaded triangles is the same as the length of each side of the square.

Length of small square = \[ \sqrt{144} = 12 \text{ cm} \]
Area of big square = \[ 24 \text{ cm} \times 24 \text{ cm} = 576 \text{ cm}^2 \]
Area of unshaded parts = \[ \frac{1}{2} \times 24 \text{ cm} \times 24 \text{ cm} = 288 \text{ cm}^2 \]

\[ \text{Fraction} = \frac{576 - (288 + 144)}{576} = \frac{1}{4} \]
\[ \frac{1}{4} \text{ of the figure is made up of the shaded triangles.} \]

Question 11

Area of Triangle BCJ and Triangle CDE
\[ = 2 \times \frac{1}{2} \times 20 \text{ cm} \times 10 \text{ cm} = 200 \text{ cm}^2 \]
Area of Triangle GJE = \[ \frac{1}{2} \times 30 \text{ cm} \times 10 \text{ cm} = 150 \text{ cm}^2 \]
Area of Triangle ABG = \[ \frac{1}{2} \times 20 \text{ cm} \times 20 \text{ cm} = 200 \text{ cm}^2 \]
Area of two big squares = \[ 2 \times 20 \text{ cm} \times 20 \text{ cm} = 800 \text{ cm}^2 \]

Total area of shaded parts = \[ 800 \text{ cm}^2 - (150 \text{ cm}^2 + 200 \text{ cm}^2 + 200 \text{ cm}^2) = 250 \text{ cm}^2 \]

Question 12

Area of unshaded parts of Triangle ABC
\[ = \frac{1}{2} \times 36 \text{ cm} \times (18 - 5) \text{ cm} - 125 \text{ cm}^2 = 109 \text{ cm}^2 \]

Question 13

Area of unshaded parts
\[ = \frac{1}{2} \times 4.6 \text{ cm} \times 4.6 \text{ cm} + \frac{1}{2} \times 4.6 \text{ cm} \times (4.6 + 2.6) \text{ cm} + \frac{1}{2} \times 4.6 \text{ cm} \times (4.6 + 4.6) \text{ cm} = 48.3 \text{ cm}^2 \]

Total area of shaded parts = \[ 9.2 \text{ cm} \times 9.2 \text{ cm} - 48.3 \text{ cm} = 36.34 \text{ cm}^2 \]
Answers to Unit 6.2

Question 14

Area of each identical square which make up the figure
= 576 \text{ cm}^2 \div 16
= 36 \text{ cm}^2

Area of small shaded triangle
= \frac{1}{2} \times 12 \text{ cm} \times 12 \text{ cm}
= 72 \text{ cm}^2

Area of unshaded triangles
= \frac{1}{2} \times 18 \text{ cm} \times 18 \text{ cm} + \frac{1}{2} \times 24 \text{ cm} \times 6 \text{ cm}
= 234 \text{ cm}^2

Total area of the shaded triangles
= 576 \text{ cm}^2 - 234 \text{ cm}^2
= 342 \text{ cm}^2

Answers to Unit 7.1

Let’s Get Started 7.1

<table>
<thead>
<tr>
<th>S/N</th>
<th>Sentence</th>
<th>What should we do?</th>
<th>Ratio</th>
<th>Model drawing</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>E has 50% more than money than F.</td>
<td><strong>Step 1:</strong> Convert the percentage into fraction in its simplest form. 50% = \frac{1}{2}</td>
<td>E : F 3 : 2</td>
<td>E 2u 1u F 2u</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Step 2:</strong> Find the relationship between E and F.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Step 3:</strong> Express the relationship in the form of ratio if you prefer.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ask Yourself

1. Convert the percentage given into a fraction in its simplest form i.e. 20% = \frac{1}{5}.

Using the fraction, Roy has 1 more unit than Joe at first i.e. Roy : Joe = 6 : 5

At the end, Joe has 1 more unit than Roy, i.e. Roy : Joe = 5 : 6

2. If the event were to occur, Roy would have fewer stamps than Joe; and the number of stamps Joe has would increase; and the total number of stamps between them would remain the same.

Think Further

It can be rephrased as:
‘Joe has 120% as many stamps as Roy’ or
‘Roy has \( \frac{5}{6} \times 100\% \) as many stamps as Joe.’
Answers to Unit 7.1

Let’s Practise 7.1

Question 1
At first | End
---|---
G : C : Total | G : C : Total
100 : 125 : 4 | 125 : 100 : 9
4 : 5 : 9 | 5 : 4 : 9

1u = 125
9u = 9 x 125
= 1125
They have **1125 cards** altogether.

Question 2
B : A
100 : 130
10 : 13

13u = 65
1u = 65 ÷ 13
= 5
3u = 5 x 3
= 15
The difference between the two numbers is **15**.

Question 3
Percentage of girls are boys = \( \frac{50}{40} \times 100\% \)
= 125%

125% of the girls are the number of boys.

Question 4
Percentage of forks are spoons = \( \frac{10}{20} \times 100\% \)
= 50%

50% of the forks are the number of spoons.

Question 5
Difference between pink and green marbles = 50 – 40
= 10
Percent more pink than green marbles = \( \frac{10}{40} \times 100\% \)
= 25%

There are **25% more** pink marbles than green marbles in the bag.

To check that your answer is correct, you can work backwards.
25% more pink than green marbles means that the ratio of the number of pink marbles to the number of green marbles is 5 : 4.
Total = 5u + 4u
= 9u
9u = 90
1u = 90 ÷ 9
= 10
5u = 5 x 10
= 50

Answers to Unit 7.1

Question 5 (Cont.)

4u = 4 x 10
= 40
Difference = 50 – 40
= 10
There are **10 more** pink marbles than green marbles in the bag.

Question 6
At first (20% increased) | End (30% increased)
---|---
1u : 2nd | 2u : 3rd + 4th
100 : 120 | 100 : 130
5u : 6th | 10u : 13th
25 : 30 | 30 : 39

Summary
1st : 2nd : 3rd + 4th
25 : 30 : 39

39u = 585
1u = 585 ÷ 39
= 15
25u = 15 x 25
= 375
There were **375 hamsters** at first.

Answers to Unit 7.2

Let’s Get Started 7.2

<table>
<thead>
<tr>
<th>Si/ N</th>
<th>Sentence</th>
<th>What should we do?</th>
<th>Ratio comparison</th>
<th>Model drawing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>C has 25% less money than D.</td>
<td><strong>Step 1:</strong> Convert the percentage into a fraction in its simplest form. 25% = ( \frac{1}{4} )</td>
<td>C : D 3 : 4</td>
<td>C 3u D 3u 1u</td>
</tr>
</tbody>
</table>

Note: C has 1 unit less than D (4 units).

**Step 2:** Find the relationship between C and D.
C has \( \frac{1}{4} \) less money than D.

**Step 3:** Express the relationship into a ratio or draw a model.
<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>X has 60% less money than Y.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Step 1:</strong> Convert the percentage into fraction in its simplest form. 60% = ( \frac{3}{5} )</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Step 2:</strong> Find the relationship between X and Y. X has less money than Y. (5 units)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Step 3:</strong> Express the relationship into a ratio or draw a model.</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Step 1:</strong> Find the relationship between X and Z. X = 1u, Z = 1u + 350</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Step 2:</strong> As the comparison involves a whole number, drawing a model is necessary.</td>
<td></td>
</tr>
</tbody>
</table>

### Ask Yourself

1. Convert the percentage into a fraction in its simplest form i.e. 35% = \( \frac{7}{20} \)
2. The number of girls is 7 units fewer than the number of adults (20 units). Therefore the relationship between the number of girls and the number of adults in the form of ratio is 13 : 20.

### Think Further

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>G</td>
<td>B</td>
<td>G</td>
</tr>
<tr>
<td>( 20^{12} )</td>
<td>( 13^{12} )</td>
<td>( 1^{13} )</td>
<td>( 2^{13} )</td>
</tr>
<tr>
<td>40</td>
<td>26</td>
<td>13</td>
<td>26</td>
</tr>
</tbody>
</table>

### Answers to Unit 7.2

#### Think Further (Cont.)

- 40u – 13u = 27u
- 27u = 324
- 1u = 324 ÷ 27 = 12
- Total people = 40u + 26u + 13u = 79u
- 79u = 79 × 12 = 948
- **948 people** attended the concert.

#### Let’s Practise 7.2

**Question 1**

<table>
<thead>
<tr>
<th>B</th>
<th>G</th>
<th>C</th>
<th>C</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>100</td>
<td>10</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Summary

<table>
<thead>
<tr>
<th>B</th>
<th>G</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>27</td>
</tr>
</tbody>
</table>

- 27u = 540
- 1u = 540 ÷ 27 = 20
- 2u = 2 × 20 = 40
- There were **40 girls**.

**Question 2**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>End</td>
<td></td>
</tr>
<tr>
<td>C : K</td>
<td>Total</td>
<td></td>
</tr>
<tr>
<td>20 : 100</td>
<td>C : K</td>
<td>Total</td>
</tr>
<tr>
<td>1 : 50</td>
<td>2 : 25</td>
<td>2 : 50</td>
</tr>
<tr>
<td>5 : 25</td>
<td>3 : 30</td>
<td>3 : 30</td>
</tr>
<tr>
<td>12 : 30</td>
<td>12 : 18</td>
<td>12 : 30</td>
</tr>
</tbody>
</table>

- 25u – 18u = 7u
- 7u = 210
- 1u = 210 ÷ 7 = 30
- C (end), 12u = 12 × 30 = 360
- K (end), 18u = 18 × 30 = 540
- Cliff and Kevin had **$360** and **$540** in the end respectively.

**Question 3**

**Last Year**

<table>
<thead>
<tr>
<th>Daughter</th>
<th>Yvonne</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>100</td>
</tr>
<tr>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

**Note:** X has 3 units less than Y (5 units).
Answers to Unit 7.2

Question 3 (Cont.)
Total age (last yr), 6u = 50 – 2
= 48
1u = 48 ÷ 6
= 8
Daughter’s age (3 yrs’ time) = 8 + 4
= 12
Her daughter will be **12 years old** in 3 years’ time.

Question 4

<table>
<thead>
<tr>
<th>End</th>
<th>J : B : Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>100</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9u</td>
<td>360</td>
</tr>
<tr>
<td>1u</td>
<td>360 ÷ 9</td>
</tr>
<tr>
<td>4u</td>
<td>4 x 40</td>
</tr>
</tbody>
</table>

Julian gave **$160** to Brendon.

Question 5

<table>
<thead>
<tr>
<th></th>
<th>A : B : C</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>80 : 100</td>
</tr>
<tr>
<td>5u</td>
<td>42 : 34</td>
</tr>
<tr>
<td>15</td>
<td>12 : 20</td>
</tr>
</tbody>
</table>

Summary

<table>
<thead>
<tr>
<th>A : B : C</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 : 12 : 20</td>
</tr>
</tbody>
</table>

5u = 500
1u = 500 ÷ 5
= 100
12u = 12 x 100
= 1200
(a) Brenna’s salary is **$1200**.

Brenna (current) : Brenna (New)

<table>
<thead>
<tr>
<th>100</th>
<th>80</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>

5p = 1200
1p = 1200 ÷ 5
= 240
4p = 4 x 240
= 960
Or, Brenna’s new salary = \( \frac{4}{5} \times 1200 \)
= 960
(b) Brenna’s new salary is **$960**.

Answers to Unit 7.2

Question 6

<table>
<thead>
<tr>
<th>G : R : P</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 : 100</td>
</tr>
<tr>
<td>2 : 10</td>
</tr>
</tbody>
</table>

Summary

<table>
<thead>
<tr>
<th>G : R : P</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 : 10 : 7</td>
</tr>
</tbody>
</table>

5u = 330
1u = 330 ÷ 5
= 66
19u = 19 x 66
= 1254
(a) There are a total of **1254 balls** in the playpen.

Percentage of the number of green balls is the number of purple = \( \frac{2}{7} \times 100\% \)
= 28\% 4\%
(b) There are **28\% 4\%** green balls as compared to the number of purple balls.

Answers to Unit 7.3

Ask Yourself

1. ‘same number of stamps’ at first hints that we have to solve the problem sum from the beginning.

Think Further

1. At 25% (\( \frac{1}{4} \)), Vincent’s end = 3u.

At 50% (\( \frac{1}{2} \)), Vincent’s end = 2u

Difference (end) = 3u – 2u
= 1u
1u = 30
Vincent had **30 more** stamps in the end.

Let’s Practise 7.3

Question 1

<table>
<thead>
<tr>
<th>At first</th>
<th>Working</th>
</tr>
</thead>
<tbody>
<tr>
<td>TT</td>
<td>10u</td>
</tr>
<tr>
<td>TC</td>
<td>10u</td>
</tr>
</tbody>
</table>

In the end

<table>
<thead>
<tr>
<th>TT</th>
<th>10u</th>
<th>3u</th>
<th>3u</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC</td>
<td>10u</td>
<td>3u</td>
<td>45</td>
</tr>
</tbody>
</table>

3u = 45
1u = 45 ÷ 3
= 15
16u = 16 x 15
= 240
There were **240 toy trains** in the end.
Answers to Unit 7.3

Question 2
At first
\[
\begin{array}{c|c|c}
T & 10u & 10u \\
N & 10u & 10u \\
\end{array}
\]

In the end
\[
\begin{array}{c|c|c}
T & 10u & 2u & 3u \\
N & 10u & 2u & \hline
\end{array}
\]

Tom increased 20% (if receiving another $300 from father)
\[
\begin{align*}
\frac{1}{5} \times 15u &= 3u \\
3u &= 300 \\
1u &= 300 \div 3 \\
&= 100 \\
3u &= 3 \times 100 \\
&= 300
\end{align*}
\]
The difference in the amount of money is \$300.

Question 3
At first
\[
\begin{array}{c|c|c}
A & 10u & 10u \\
O & 10u & 10u \\
\end{array}
\]

\textbf{Monday}
\[
\begin{array}{c|c|c}
A & 10u & 8u \\
O & 10u & 10u \\
\end{array}
\]

\textbf{Tuesday}
\[
\begin{array}{c|c|c|c|c}
A & 8u & 2u & 8u & 9u \\
O & 8u & 2u & & 38 \\
\end{array}
\]

19u = 38
1u = 38 + 19
= 2
20u = 20 \times 2
= 40

There were 40 apples and oranges in the crate at first.

Question 4
\textbf{Morning}
\[
\begin{array}{c|c|c}
T & 10u & 10u \\
C & 10u & 10u \\
\end{array}
\]

\textbf{Noon}
\[
\begin{array}{c|c|c|c}
T & 7u & 3u & 2u \\
C & 7u & 3u & 3u \\
\end{array}
\]

\textbf{7 p.m.}
\[
\begin{array}{c|c|c|c|c}
T & 7u & 3u & 2u & \hline \\
C & 7u & 3u & & \hline
\end{array}
\]

Value of 20¢ used = 27 \times 0.2
= 5.4
Value of 50¢ used = 51 \times 0.5
= 25.5
Cost of present = 25.5 + 5.4
= 30.9
The present cost $30.90.

Question 5
At end
\[
\begin{array}{c|c|c}
W & 7u & 70 \\
B & 7u & 40 \\
\end{array}
\]

\textbf{Monday}
\[
\begin{array}{c|c|c}
W & 7u & 70 \\
B & 7u & 40 \\
\end{array}
\]

3u = 70 - 40
= 30
1u = 30 \div 3 = 10
7u + 70 = 7 \times 10 + 70
= 140

There were 140 white sneakers in the shop at first.

Question 6
\textbf{End}
\[
\begin{array}{c|c|c}
50c & 2u & 51 \\
20c & 2u & 24 \\
\end{array}
\]

3u = 51 - 24
= 27
1u = 27 \div 3
= 9

Value of 20¢ used = 27 \times 0.2
= 5.4
Value of 50¢ used = 51 \times 0.5
= 25.5
Cost of present = 25.5 + 5.4
= 30.9
The present cost $30.90.
Answers to Unit 7.4

Ask Yourself
The individual amount of money will change. However, their total amount of money will remain unchanged.

Let's Practise 7.4

Question 1
At first | End
---|---
B : R : Total | B : R : Total
3x : 7^2 : 10^2 | 1^5 : 3^1 : 4^5
6 : 14 : 20 | 5 : 15 : 20

Gave = 6u – 5u
= 1u
1u = 5
20u = 20 × 5
= 100
The boys were given a total of $100.

Passed = 30u – 11u
= 19u
19u = 57
1u = 57 ÷ 19
= 3
55u = 55 × 3
= 165
40% cards sold = 0.4 × 165
= 66
Amount collected = 66 × $2
= $132

$132 was collected from the sale of the cards.

Question 2
At first | End
---|---
J : P : Total | J : P : Total
5^2 : 6^4 : 11^5 | 4^{11} : 1^{11} : 5^{11}
25 : 30 : 55 | 44 : 11 : 55

Passed = 30u – 11u
= 19u
19u = 57
1u = 57 ÷ 19
= 3
55u = 55 × 3
= 165
40% cards sold = 0.4 × 165
= 66
Amount collected = 66 × $2
= $132

$132 was collected from the sale of the cards.

Question 3
At first | End
---|---
A : B : Total | A : B : Total
2^3 : 3^5 : 5^15 | 1^5 : 2^5 : 3^5
6 : 9 : 15 | 5 : 10 : 15

5u = 110
1u = 110 ÷ 5
= 22
Transferred = 6u – 5u
= 1u

22 mint candies were transferred from Tin A to Tin B.

Answers to Unit 7.5

Ask Yourself
1. Yes. The keywords are “of the remaining”.
2. Units are used.

---

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Answers to Unit 7.5

Let's Practise 7.5

Question 1

(a) Percentage of salary on grocery = \( \frac{1}{4} \times 100\% = 25\% \)

She spent 25% of her salary on groceries.

(b) \( 2u = 560 \)

1u = 560 ÷ 2

= 280

4u = 4 × 280

= 1120

Her monthly salary was $1120.

Question 2

Difference = 10u – 6u

= 4u

4u = 40

1u = 40 ÷ 4

= 10

25u = 25 × 10

= 250

He sold 250 mugs altogether at the flea market.

Question 3 (Cont.)

1u = 15u ÷ 5

= 3u

Remainder 1

3u

(15u)

Red-striped

Remainder 2

5u

(15u)

Black-striped

Total

\( \frac{1}{5} \) Total = 9u

\( \frac{1}{5} \) Total = 9u × 5

= 45u

Blue-striped = 45u – 20u

= 25u

25u = 250

1u = 250 ÷ 25

= 10

30u = 30 × 10

= 300

300 red and blue-striped jerseys were sold altogether.

Question 5

Total number of fruits (T)

\( \frac{1}{2} \) T + $10

Remainder (R)

\( \frac{1}{5} \) R + $8

Left $16

For more review questions, please visit [www.onsponge.com](http://www.onsponge.com).
Answers to Unit 7.5

Question 5 (Cont.)

4 \frac{1}{5} R = 8 + 16
= $24

1 \frac{4}{5} R = 24 \div 4
= $6

\frac{5}{5} R = 6 \times 5
= $30

\frac{1}{3} T = 10 + 30
= $40

\frac{3}{3} T = 3 \times 40
= $120

(a) Rachel had $120 at first.
Amount spent (mangosteens) = \frac{1}{5} R + $8
= $6 + $8
= $14
Number of kg = $14 \div $2
= 7

(b) She bought 7 kg of mangosteens.

Question 6

Total number of coins (T)

50c coins \left(\frac{2}{5} T + 3\right)

Remainder (R)

20c coins \left(\frac{1}{4} R + 9\right)

$1 coins 18

Number of $1 coins = $18 + $1
= 18

\frac{3}{4} R = 18 + 9
= 27

\frac{1}{4} R = 27 \div 3
= 9

\frac{4}{4} R = 4 \times 9
= 36

\frac{3}{5} T = 36 + 3
= 39

\frac{1}{5} T = 39 + 3
= 13

Number of 20c coins = \frac{1}{4} R + 9
= 9 + 9
= 18

\frac{3}{4} T = 120 \div 3
= 40

\frac{1}{4} T = 40 \div 10
= 4

\frac{1}{5} T = 4 \times 5
= $20

\frac{2}{5} T = 2 \times 5
= $10

Answer 6 (Cont.)

Number of 50c coins = \frac{2}{5} T + 3
= 2 \times 13 + 3
= 29

Total amount = 18 \times 0.2 + 29 \times 0.5 + 29 \times 1
= 36.1

The total value of all the coins in the purse is $36.10.

Answers to Unit 7.6

Ask Yourself
1. ‘equal amounts of money left’ hints to start solving from the end of the problem sum by working backwards.

Think Further
The ‘Numerator the Same’ concept will still be used to arrive at the total but the answer will change to $405.

Spent
\frac{3x}{10x} L = \frac{9}{20} L

\frac{9}{30} C = \frac{9}{20} L

Difference between Catherine and Lucy = 30u – 20u
= 10u
10u = 225
1u = 225 \div 10
= 22.5

Total spent = 9u \times 2
= 18u

18u = 18 \times 22.5
= 405

They spent $405 altogether.

Let’s Practise 7.6

Question 1

45% = \frac{45}{100} = \frac{9}{20}

83 \frac{1}{3}% = \frac{83}{3} \div 100
= \frac{5}{6}

\frac{9x}{20x} of Jillian = \frac{5x}{6x} of Lenard

\frac{45}{100} of Jillian = \frac{45}{54} of Lenard

Total

\frac{J}{100} : \frac{L}{54}

Difference = 100u – 54u
= 46u
46u = 92
1u = 92 \div 46
= 2
154u = 154 \times 2
= 308

Their combined allowance is $308.
Answers to Unit 7.6

Question 2
30% = \( \frac{30}{100} = \frac{3}{10} \)
33 1/3% = \( \frac{100}{3} \times \frac{1}{3} = \frac{33}{10} \)
1/3 of Eddie = \( \frac{1}{3} \times 3 = 1 \)
1/3 of Benjamin = \( \frac{1}{3} \times 3 = 1 \)

Total
E : B
10 : 9

19u = 380
1u = 380 ÷ 19
  = 20
10u = 10 × 20
  = 200

Eddie has 200 stamps.

Question 3

Left
\( \frac{11}{20} \) of Alba = \( \frac{2 \times 11}{5 \times 11} \) of Dale
\( \frac{22}{40} \) of Alba = \( \frac{2 \times 22}{5 \times 22} \) of Dale

Total
A : D
40 : 55

\( \frac{1}{2} \) of Alba = \( \frac{1}{2} \times 40u = 20u \)

\( \frac{350}{1u} = 350 \)
1u = 350 ÷ 35
  = 10
55u = 55 × 10
  = 550

Dale had $550 at first.

Question 4

Left
\( \frac{9}{50} \) of Raymond = \( \frac{1 \times 9}{2 \times 9} \) of Zack
\( \frac{9}{50} \) of Raymond = \( \frac{9}{18} \) of Zack

Total
R : Z
50 : 18

\( \frac{1}{5} \) of Raymond = \( \frac{1}{5} \times 50u = 10u \)
\( \frac{1}{2} \) of Zack = \( \frac{1}{2} \times 18u = 9u \)

\( \frac{3}{10} \) of Eddie = \( \frac{1 \times 3}{3 \times 3} \) of Benjamin
\( \frac{1}{10} \) of Eddie = \( \frac{3}{9} \) of Benjamin

\( \frac{33}{1} \div \frac{100}{1} = \frac{33}{10} \)

10u = 10 × 20
  = 200

Eddie has 200 stamps.

Question 4 (Cont.)

Difference = 10u – 9u
  = 1u
1u = 10.5
50u = 50 × 10.5
  = 525

Raymond had $525 at first.

Question 5

Remained
\( \frac{3}{4} \) of School A is 3 times of \( \frac{1}{2} \) of School B.
\( \frac{3}{4} \) of School A = \( 3 \times \frac{1}{2} \) of School B
\( \frac{3}{4} \) of School A = \( \frac{3}{2} \) of School B

OR \( \frac{3}{4} \) of School A is 3 times of \( \frac{1}{2} \) of School B (the numerator of School A is now thrice of the numerator of School B, so there is nothing further needed to be done)

Total
A : B
4 : 2

2u = 200
1u = 200 ÷ 2
  = 100
4u = 100 × 4
  = 400

There were 400 students in School A at first.

Question 6

Left
\( \frac{9}{10} \) of Jake is 2 times of \( \frac{3}{5} \) of Kim.
\( \frac{9}{10} \) of Jake = \( 2 \times \frac{3}{5} \) of Kim

\( \frac{9 \times 2}{10 \times 2} \) of Jake = \( \frac{6 \times 3}{5 \times 3} \) of Kim (making numerators the same)
\( \frac{18}{20} \) of Jake = \( \frac{18}{15} \) of Kim

Total
J : K
20 : 15

5u = 315
1u = 315 ÷ 5
  = 63
50u = 50 × 10.5
  = 525

Kim at first = 15u = 15 × 63
  = 945

Amount Kim had left = \( \frac{3}{5} \times 945 = 567 \)
**Answers to Unit 7.6**

**Question 6 (Cont.)**

OR

By making the numerator of Jake to be twice of the numerator of Kim.

What their numerators (left) should be

\[
\begin{align*}
J &: K \\
2^2 &: 1^2 \\
6^3 &: 3^3 \\
18 &: 9
\end{align*}
\]

\[
\frac{9 \times 2}{10 \times 2} \text{ of Jake is } 2 \text{ times of } \frac{3 \times 3}{5 \times 3} \text{ of Kim.}
\]

\[
\frac{18}{20} \text{ of Jake is } 2 \text{ times of } \frac{9}{15} \text{ of Kim (the numerator of Jake is now twice of the numerator of Kim)}.
\]

\[
5u = 315 \\
1u = 315 \div 5 = 63 \\
9u = 9 \times 63 = 567
\]

Kim had $567$ left.

**Answers to Unit 7.7**

**Ask Yourself**

1. \[
\begin{align*}
J &: G &: A \\
40 &: 100 &: 140 \\
2^7 &: 5^1 &: 7^3 \\
14 &: 35 &: 35 \\
J &: G &: A \\
14 &: 35 &: 25
\end{align*}
\]

Difference between Ginny and Annie = $35u - 25u = 10u$

Jessie's percentage = \[
\frac{14}{10} \times 100\% = 140\% 
\]

**Think Further**

At first

\[
\begin{align*}
J &: G &: A \\
14 &: 35 &: 25 \\
G + A &= 60u \\
\frac{1}{3} \text{ of } 60u &= 12u \\
G &: A &: \text{Total} \\
3 &: 1 &: 4 \\
4p &= 12u \\
1p &= 12u \div 4 \\
&= 3u \\
\text{Annie gave} &= 3u \\
\text{Ginny gave} &= 9u
\end{align*}
\]

**Answers to Unit 7.7**

End

\[
\begin{align*}
J &: G &: A \\
26 &: 26 &: 22
\end{align*}
\]

(a) Annie would have the least number of beads in the end.

(b) Most number of beads = Jessie/Ginny

\[
\text{Difference} = 26u - 22u = 4u \\
\text{Percentage} = \frac{4}{26} \times 100\% = 15.38\%
\]

**Let's Practise 7.7**

**Question 1**

\[
\begin{align*}
J &: D &: J \\
120 &: 100 &: 60 \\
6 &: 5 &: 6 \\
J &: G &: A \\
20 &: 15
\end{align*}
\]

\[
\begin{align*}
5u &= 315 \\
1u &= 315 \div 5 = 63 \\
9u &= 9 \times 63 = 567
\end{align*}
\]

Kim had $567$ left.

\[
\begin{align*}
J &: G &: A \\
26 &: 26 &: 22
\end{align*}
\]

(a) Annie would have the least number of beads in the end.

(b) Most number of beads = Jessie/Ginny

\[
\text{Difference} = 26u - 22u = 4u \\
\text{Percentage} = \frac{4}{26} \times 100\% = 15.38\%
\]

**Question 2**

\[
\begin{align*}
S &: J &: D \\
110 &: 100 &: 80 \\
11^{12} &: 10^{12} &: 5^{15} \\
22 &: 20 &: 25 \\
S &: J &: D \\
22 &: 20 &: 25
\end{align*}
\]

\[
\begin{align*}
3u &= 9 \\
1u &= 9 \div 3 = 3 \\
20u &= 20 \times 3 = 60
\end{align*}
\]

Joey’s score was $60$.

**Question 3**

At first

\[
\begin{align*}
M &: W \\
13^{14} &: 5^{14} \\
52 &: 20
\end{align*}
\]

Women, end (65%) = \[
\frac{13}{20} \times 20u = 13u
\]

Change in the no. of men = $52u - 13u = 39u$

\[
\text{Percentage change in the no. of men} = \frac{39}{52} \times 100\% = 75\%
\]

75% of the men must leave.
Answers to Unit 7.7

Question 4

Last week

<table>
<thead>
<tr>
<th>C</th>
<th>M</th>
<th>C+M</th>
</tr>
</thead>
<tbody>
<tr>
<td>3^3</td>
<td>2^4</td>
<td>5^4</td>
</tr>
<tr>
<td>12</td>
<td>8</td>
<td>20</td>
</tr>
</tbody>
</table>

Sold

<table>
<thead>
<tr>
<th>Last week (C+M)</th>
<th>This week (C+M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4^3</td>
<td>5^3</td>
</tr>
<tr>
<td>20</td>
<td>25</td>
</tr>
</tbody>
</table>

25u = 150

1u = 150 ÷ 25

= 6

Sold last week = 20u

= 20 × 6

= 120

120 cannoli and mudpies were sold last week.

Question 5

\[
\begin{align*}
\text{C (PktA)} & : S (Pkt A) : \text{Pkt A} \\
3^3 & : 2^4 : 5^4 \\
12 & : 8 : 20 \\
\text{C (Pkt B)} & : \text{C (Pkt A)} \\
5^3 & : 4^3 \\
15 & : 12 \\
\text{Pkt A} & : \text{Pkt B} \\
1^{20} & : 2^{30} \\
20 & : 40
\end{align*}
\]

No. of strawberry cookies in Packet B = 40u – 15u = 25u

No. of strawberry cookies needed in Packet A to be equal = 12u – 8u = 4u

Percentage of strawberry cookies in Packet B to be transferred

\[
\frac{4}{25} \times 100\% = 16\%
\]

She would need to transfer 16% of the strawberry cookies in Packet B into Packet A.

Question 6

\[
\begin{align*}
\text{C : P + S} & : \text{P : S : P + S} \\
9^{14} & : 11^{4} : 2^{11} : 1^{11} : 4^{11} \\
36 & : 44 : 33 : 11 : 44
\end{align*}
\]

\[
\begin{align*}
\text{C : P : S : Total} \\
36 & : 33 : 11 : 80
\end{align*}
\]

Chicken Puff Left = \(\frac{1}{4} \times 36u\)

= 9u

Change

<table>
<thead>
<tr>
<th>C : P : Total</th>
<th>End C : P : Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 : 33 : 42</td>
<td>9 : 42 : 20</td>
</tr>
</tbody>
</table>

Percentage sold = \(\frac{12}{33} \times 100\% = \frac{36}{11}\%

Answers to Unit 7.8

Ask Yourself

1. The total number of items (in this case, dominoes) in Day 1 and Day 2 remain unchanged since Kyle wanted to lay a pattern using all his dominoes.

Think Further

\[
\begin{align*}
\text{Total dominos} & : 10u^{14} (40u) \\
1^{14} & : 3u^{14} (12u) \\
\text{Remainder} & : 7u^{14} (28u) \\
2^{14} & : 1u^{17} (7u) \\
\text{Left} & : 3u^{17} (21u)
\end{align*}
\]

\[
\begin{align*}
21u & = 84 \\
1u & = 84 ÷ 21 \\
& = 4 \\
40u & = 40 \times 4 \\
& = 160 \\
\text{Kyle had 160 dominoes in his collection.}
\end{align*}
\]

Let’s Practise 7.8

Question 1

At first

Complete : Incomplete : Total
7 : 13 : 20

End

Complete : Incomplete : Total
3^{15} : 1^{15} : 4^{15}
15 : 5 : 20

Ran in 2^{nd} hr = 15u – 7u

= 8u

8u = 16.8

1u = 16.8 ÷ 8

= 2.1

20u = 20 × 2.1

= 42

The total distance of the marathon was 42 km.

Question 2

1^{st} week

Not fixed : Fixed : Total
6^{17} : 5^{17} : 11^{17}
42 : 35 : 77

2^{nd} week

Not fixed : Fixed : Total
2^{111} : 5^{111} : 7^{111}
22 : 55 : 77
Answers to Unit 7.8

Question 2 (Cont.)

55u = 110
1u = 110 \div 55
= 2
77u = 77 \times 2
= 154
The model aeroplane required 154 pieces.

Question 3

At first

<table>
<thead>
<tr>
<th>N : R : Total</th>
<th>End</th>
</tr>
</thead>
<tbody>
<tr>
<td>2^{12} : 5^{12} : 7^{12}</td>
<td>7^{17} : 5^{17} : 12^{17}</td>
</tr>
<tr>
<td>24 : 60 : 84</td>
<td></td>
</tr>
</tbody>
</table>

25u = 75
1u = 75 \div 25
= 3
84u = 84 \times 3
= 252
The girls shared 252 jelly beans.

Question 4

At first

<table>
<thead>
<tr>
<th>K : N : Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1^{14} : 4^{14} : 5^{14}</td>
</tr>
<tr>
<td>4 : 16 : 20</td>
</tr>
</tbody>
</table>

11u = 66
1u = 66 \div 11
= 6
Karen sold (80\%) = \frac{4}{5} \times 15u
= 12u
12u = 12 \times 6
= 72
Amount collected by Karen = 72 \times 1.25
= 90
She collected $90 for the event.

Question 5

At first

<table>
<thead>
<tr>
<th>B : G : Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>7^{15} : 5^{15} : 12^{15}</td>
</tr>
<tr>
<td>35 : 25 : 60</td>
</tr>
</tbody>
</table>

13u = 52
1u = 52 \div 13
= 4
48u = 48 \times 12u
= 144
144 more boys than girls would visit Germany.

Answers to Unit 7.8

Question 6

At first

<table>
<thead>
<tr>
<th>R : W : Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>3^{14} : 2^{14} : 5^{14}</td>
</tr>
<tr>
<td>12 : 8 : 20</td>
</tr>
</tbody>
</table>

3u = 120
1u = 120 \div 3
= 40
Difference = 12u – 8u
= 4u
4u = 4 \times 40
= 160
There were 160 more red than white ribbons in the box.

Answers to Unit 7.9

Ask Yourself
1. At the start of the lesson in the morning, there were some students in Mrs Wong’s class. After recess, 10 boys joined her class for remedial lesson. As a result, the percentage of the number of girls in the classroom decreased from 60\% to 45\%. How many girls were there in Mrs Wong’s classroom?

Let’s Practise 7.9

Question 1

At first

<table>
<thead>
<tr>
<th>Chocolate : Vanilla</th>
</tr>
</thead>
<tbody>
<tr>
<td>2^{2^2} : 3^{2^2}</td>
</tr>
<tr>
<td>10 : 4</td>
</tr>
</tbody>
</table>

5u = 25
1u = 25 \div 5
= 5
10u = 10 \times 5
= 50
Jasmine bought 50 cupcakes for her family.

Question 2

At first

<table>
<thead>
<tr>
<th>Male : Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>5^{12} : 3^{12}</td>
</tr>
<tr>
<td>10 : 6</td>
</tr>
</tbody>
</table>

9u = 81
1u = 81 \div 9
= 9
6u = 6 \times 9
= 54
There were 54 female passengers at first.
Answers to Unit 7.9

Question 3
At first
Male : Female
7 : 2
14 : 26

End
Male : Female
2 : 3
14 : 21

14u + 26u = 40u
40u = 120
1u = 120 ÷ 40
= 3
5u = 5 × 3
= 15
15 females left the queue.

Question 4
At first
50-cent : 20-cent
1 : 3
3 : 6

End
50-cent : 20-cent
5 : 3
4u

1u = 100
4u = 4 × 100
= 400 (no. of 20-cent coins used)

400 × 0.2 = 80
John spent $80 on the toy.

Question 5
At first
Cars : Motorcycles + Lorries
2 : 3
6 : 9

End
Cars : Motorcycles + Lorries
3 : 2
7u

4u = 40
1u = 40 ÷ 4
= 10

Number of lorries and motorcycles that left the car park, 7u = 7 × 10 = 70
Motorcycles that left the car park = \( \frac{3}{5} \times 70 = 42 \) motorcycles

42 motorcycles left the car park.

Question 6
At first
B : M
2 : 3
6 : 9

End
B : M
23 : 33
10u

10u = 80
1u = 80 ÷ 10
= 8
15u = 15 × 8
= 120

There were 120 hairclips in the box at first.

Answers to Unit 7.10

Ask Yourself
1. Since William’s father’s age is not the same every year, the numerator and denominator in comparison at every stage of their ages will differ.

Let’s Practise 7.10

Question 1
Now
J : G : Diff
1 : 5
14 : 26

Future
J : G : Diff
14 : 25
44 : 100

30u

Jason now, 14u = 13 – 6
= 7
1u = 7 ÷ 14
= 0.5
No. of years passed = 44u – 14u
= 30u
30u = 30 × 0.5
= 15
In 15 years’ time, Jordan’s age will be 44% of Gordon’s age.

Question 2
Past (4 yrs ago)
W : R : Diff
1 : 4
5 : 20

Now
11 : 9
5 : 20 : 15

Future (8 yrs later)
W : R : Diff
11 : 15
4 : 24 : 15

9u – 5u = 4u
4u = 4 + 8
= 12
1u = 12 ÷ 4
= 3

Difference between Raymond and Wayne = 15u
15u = 15 × 3
= 45
Raymond is 45 years older than Wayne.

Question 3
At first
L : T : Diff
11 : 20 : 9

In the end
L : T : Diff
45 : 54 : 9

34u

Difference = 45u – 11u
= 34u
34u = 68
1u = 68 ÷ 34
= 2
20u = 20 × 2
= 40

There were 40 trees at first.
Answers to Unit 7.10

Question 4

At first End
S : V : Diff S : V : Diff
7\(x^7\) : 6\(x^7\) : 1\(x^7\) 20 : 13 : 7
49 : 42 : 7

Total (in the end) = 20u + 13u = 33u
33u = 165
1u = 165 \div 33 = 5
Each type of puffs eaten = 49u – 20u = 29u
29u = 29 \times 5 = 145

145 puffs of each type were eaten.

Question 5

Pills collected every week

\[
\begin{array}{c|c|c}
\text{E} & \text{O} \\
\hline
28 & 28 \\
28 & 5u \\
\end{array}
\]

After some time (pills consumed by family)

\[
\begin{array}{c|c|c}
\text{E} & \text{O} \\
\hline
468 & \\
5u & \\
\end{array}
\]

Number of weeks to consume 364 pills = \(364 \div 56 = 6.5\)
Mrs Elly’s family consumed more each week = \(468 \div 6.5 = 72\)
2u = 72
1u = 72 \div 2 = 36
Each week Mrs Elly’s family consumed, 7u = 7 \times 36 = 252

252 – 28 = 224
224 \div 14 = 16
(a) There are 16 family members in Mrs Elly’s family.
5u = 5 \times 36 = 180
(b) Each week, Mrs Osman collects 180 vitamin pills.

Question 6

\[
\begin{array}{c|c|c}
\text{A} & \text{B} & \text{C} \\
\hline
& & \\
\end{array}
\]

Square = A + B
Five-sided figure = B + C

\[
\begin{array}{c|c|c}
\text{A} & \text{B} & \text{C} \\
\hline
3u & 7u & \\
+17 & +5 & \\
\end{array}
\]

In the end

\[
\begin{array}{c|c|c|c}
\text{A} & \text{B} & \text{C} \\
\hline
15u & 28u & \\
+85 & +20 & \\
\end{array}
\]

In the end

\[
\begin{array}{c|c|c|c}
\text{A} & \text{B} & \text{C} \\
\hline
20p & 20p & \\
\end{array}
\]

Answers to Unit 7.11

Ask Yourself
1. Yes, all items have changed, including the total and the difference.

Let’s Practise 7.11

Question 1

\[
\begin{array}{c|c|c|c}
\text{Actual} & \text{R} & \text{J} \\
\hline
\text{At first} & 6u & 5u & \\
\text{Change} & +50 & +45 & \\
\text{In the end} & 5p & 3p & \\
\end{array}
\]

\[
\begin{array}{c|c|c|c}
\text{Working} & \text{R} & \text{J} \\
\hline
\text{At first} & 18u & 25u & \\
\text{Change} & +150 & +45 & \\
\text{In the end} & 15p & 15p & \\
\end{array}
\]

R \(18u \times 15 = 270\)
J \(25u \times 15 = 375\)

\[
\begin{array}{c|c|c|c}
\text{A} & \text{B} & \text{C} \\
\hline
3u & 7u & \\
+17 & +5 & \\
\end{array}
\]

In the end

\[
\begin{array}{c|c|c|c}
\text{A} & \text{B} & \text{C} \\
\hline
15u & 28u & \\
+85 & +20 & \\
\end{array}
\]

In the end

\[
\begin{array}{c|c|c|c}
\text{A} & \text{B} & \text{C} \\
\hline
20p & 20p & \\
\end{array}
\]

5u + 9 = 5 \times 15 + 9 = 84

(b) Joyce had $84 in the end.
Answers to Unit 7.11

Question 2 (Cont.)

\[
\begin{array}{ccc}
A & 15u & 65 & 20 \\
B & 15u & 13u & 20 \\
\hline
& & 20p \\
\end{array}
\]

\[13u = 65\]
\[1u = 65 + 13\]
\[= 5\]
\[10u = 10 \times 5\]
\[= 50\]

(a) There were **50 mangoes** in both boxes at first.
\[3u + 17 = 3 \times 5 + 17\]
\[= 32\]

(b) There were **32 mangoes** in Box A in the end.

Question 3

\[
\begin{array}{c|c|c}
\text{(Actual)} & 50\text{₵} & $1 \\
\hline
\text{At first} & 5u^{15} & 4u^{13} \\
\text{Change} & -38^{15} & -20^{13} \\
\hline
\text{In the end} & 3p^{15} & 5p^{13} \\
\end{array}
\]

\[
\begin{array}{c|c|c}
\text{(Working)} & 50\text{₵} & $1 \\
\hline
\text{At first} & 25u & 12u \\
\text{Change} & -190 & -60 \\
\hline
\text{In the end} & 15p & 15p \\
\end{array}
\]

\[13u = 130\]
\[1u = 130 \div 13\]
\[= 10\]
\[4u = 4 \times 10\]
\[= 40\]

(a) There were **40 $1** coins at first.
\[5u - 38 = 5 \times 10 - 38\]
\[= 12\]
\[12 \times $0.50 = $6\]

(b) There was **$6** worth of 50-cent coins in the end.

Question 4

\[
\begin{array}{c|c|c}
\text{(Actual)} & J & C \\
\hline
\text{At first} & 27u^{12} & 20u^{13} \\
\text{Change} & -39^{12} & -70^{13} \\
\hline
\text{In the end} & 3p^{12} & 2p^{13} \\
\end{array}
\]

\[
\begin{array}{c|c|c}
\text{(Working)} & J & C \\
\hline
\text{At first} & 54u & 60u \\
\text{Change} & -78 & -210 \\
\hline
\text{In the end} & 6p & 6p \\
\end{array}
\]

\[6u = 132\]
\[1u = 132 \div 6\]
\[= 22\]

Difference at first, \[7u = 7 \times 22\]
\[= 154\]
\[154 \times 7.9 = 1216.6\]

Joreen spent **$1216.60** more on the shirts than Cailin.

Question 5

\[
\begin{array}{c|c|c}
\text{(Actual)} & A & B \\
\hline
\text{At first} & 7u^{10} & 5u^{13} \\
\text{Change} & 110^{10} & +150^{13} \\
\hline
\text{In the end} & 3p^{10} & 5p^{13} \\
\end{array}
\]

\[
\begin{array}{c|c|c}
\text{(Working)} & A & B \\
\hline
\text{At first} & 35u & 15u \\
\text{Change} & -550 & +450 \\
\hline
\text{In the end} & 15p & 15p \\
\end{array}
\]

\[20u = 450 + 550\]
\[= 1000\]
\[1u = 1000 \div 20\]
\[= 50\]

Shop A’s earnings, \[7u - 110 = 7 \times 50 - 110\]
\[= 240\]

Shop A earned **$240** over the two days.

Question 6

\[
\begin{array}{c|c|c}
\text{(Actual)} & Z & S \\
\hline
\text{At first} & 5u^{12} & 3u^{13} \\
\text{Change} & 15^{12} & 4^{13} \\
\hline
\text{In the end} & 3p^{12} & 2p^{13} \\
\end{array}
\]

\[
\begin{array}{c|c|c}
\text{(Working)} & Z & S \\
\hline
\text{At first} & 10u & 9u \\
\text{Change} & -30 & +12 \\
\hline
\text{In the end} & 6p & 6p \\
\end{array}
\]
Questions 6 (Cont.)

1u = 30 + 12
= 42

Z, end, 5u – 15 = 5 × 42 – 15
= 195

S, end, 3u + 4 × 3 × 42 + 4
= 130

Zuwen and Samantha had 195 beads and 130 beads in the end.

Questions 7.12

Ask Yourself

1. The number of units of each item is provided as well as the total value of the items whereas in Guess and Check, the number of units representing each item will not be given.

Let’s Practise 7.12

Question 1

Cost of 1 peach = 150% × $1.20
= $1.80

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>7u</td>
<td>1.2</td>
<td>8.4u</td>
<td></td>
</tr>
<tr>
<td>P</td>
<td>13u</td>
<td>1.8</td>
<td>23.4</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>20u</td>
<td></td>
<td>31.8u</td>
<td></td>
</tr>
</tbody>
</table>

31.8u = 636
1u = 636 ÷ 31.8
= 20

(a) 8.4u = 8.4 × 20
= 168

The apricots cost $168.

(b) 13u = 13 × 20
= 260

He ordered 260 peaches.

Question 2

Quantity Bought

<table>
<thead>
<tr>
<th>P</th>
<th>T</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>6u</td>
<td>5u</td>
<td>5u</td>
</tr>
<tr>
<td>12</td>
<td>10</td>
<td>15</td>
</tr>
</tbody>
</table>

Value/Cost of items

Toy : Pullover
3 : 5

3p = $12
1p = $12 ÷ 3
= $4

Summary of value/cost

Toy = $12
Book = $12 – $2
= $10

Pullover = $20

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>12u</td>
<td>20</td>
<td>240u</td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>10u</td>
<td>12</td>
<td>120u</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>15u</td>
<td>10</td>
<td>150u</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>37u</td>
<td></td>
<td>510u</td>
<td></td>
</tr>
</tbody>
</table>

Mrs Poon bought 456 pullovers, 380 toys and 570 books.

Question 3

Value of items

Pin = $2.50
Band = 150% × $2.50
= $3.75

Necklace = $2.50 × 2
= $5

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>5u</td>
<td>2.50</td>
<td>12.5u</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>4u</td>
<td>3.75</td>
<td>15u</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>1u</td>
<td>5</td>
<td>5u</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>10u</td>
<td></td>
<td>42.5u</td>
<td></td>
</tr>
</tbody>
</table>

Difference in total value between hairbands and hairpins

= 15u – 12.5u
= 2.5u

2.5u = 105

1u = 105 ÷ 2.5
= 42

Total items sold, 10u = 10 × 42
= 420

Gillian sold a total of 420 items.
Question 4

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20₵</td>
<td>1u</td>
<td>×</td>
<td>0.2</td>
<td>0.2u</td>
</tr>
<tr>
<td>50₵</td>
<td>2u</td>
<td>×</td>
<td>0.5</td>
<td>1u</td>
</tr>
<tr>
<td>$1</td>
<td>2u</td>
<td>×</td>
<td>1</td>
<td>2u</td>
</tr>
<tr>
<td>Total</td>
<td>5u</td>
<td></td>
<td></td>
<td>3.2u</td>
</tr>
</tbody>
</table>

Difference in total value of 50-cent coins and 20-cent coins = 1u – 0.2u = 0.8u

Wayne had 100 coins altogether.

Question 5

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>13u</td>
<td>×</td>
<td>0.5</td>
<td>6.5u</td>
</tr>
<tr>
<td>P</td>
<td>7u</td>
<td>×</td>
<td>0.4</td>
<td>2.8u</td>
</tr>
<tr>
<td>Total</td>
<td>20u</td>
<td></td>
<td></td>
<td>9.3u</td>
</tr>
</tbody>
</table>

9.3u = 195.3
1u = 195.3 + 9.3 = 21
13u = 13 × 21 = 273
(a) 273 apples were sold.
2.8u = 2.8 × 21 = 58.8
(b) $58.80 was collected from the sale of the pears only.

Question 6

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>2u</td>
<td>×</td>
<td>8</td>
<td>16u</td>
</tr>
<tr>
<td>G</td>
<td>3u</td>
<td>×</td>
<td>6</td>
<td>18u</td>
</tr>
<tr>
<td>Total</td>
<td>5u</td>
<td></td>
<td></td>
<td>34u</td>
</tr>
</tbody>
</table>

34u = 5440
1u = 5440 ÷ 34 = 160
5u = 5 × 160 = 800
800 students were at the party.

Answers to Review Questions on Chapter 7

Question 1

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>×</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>RB</td>
<td>8u</td>
<td>×</td>
<td>1p</td>
<td>8up (28.8)</td>
</tr>
<tr>
<td>D</td>
<td>5u</td>
<td>×</td>
<td>1p + 1.5</td>
<td>5up + 7.5u (40.5)</td>
</tr>
<tr>
<td>Total</td>
<td>13u</td>
<td></td>
<td></td>
<td>13up + 7.5u (69.3)</td>
</tr>
</tbody>
</table>

8up = 28.8
1up = 28.8 + 8 = 3.6
5up = 5 × 3.6 = 18
7.5u = 40.5 – 18 = 22.5
1u = 22.5 + 7.5 = 3
(a) 5u = 5 × 3 = 15
She bought 15 durian puffs.
Answers to Review Questions on Chapter 7

Question 3 (Cont.)
(b) Cost of 1 durian puffs = 40.5 ÷ 15
   = 2.7
Cost of 1 red bean cream puff = 2.7 – 1.5
   = 1.20
Each red bean cream puff cost $1.20.

Question 4

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantity of items</th>
<th>Value of items ($)</th>
<th>Total value ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$50</td>
<td>9u</td>
<td>50</td>
<td>450u</td>
</tr>
<tr>
<td>$100</td>
<td>8u</td>
<td>100</td>
<td>800u</td>
</tr>
<tr>
<td>$150</td>
<td>3u</td>
<td>150</td>
<td>450u</td>
</tr>
<tr>
<td>Total</td>
<td>20u</td>
<td></td>
<td>1700u</td>
</tr>
</tbody>
</table>

1700u = 20 400
1u = 20 400 ÷ 1700
   = 12
3u = 3 × 12
   = 36
There were 36 $150 dining vouchers.

Question 5

8u² : 5u³ : 2u³ : 3u⁴
24 : 15 : 6 : 24

Summary
P : C : E
8u² : 5u³ : 2u³
24 : 15 : 6

(Actual)

<table>
<thead>
<tr>
<th></th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>24u⁴</td>
<td>15u⁴</td>
</tr>
<tr>
<td>Change</td>
<td>-44u⁴</td>
<td>-10u⁴</td>
</tr>
<tr>
<td>In the end</td>
<td>40u⁴</td>
<td>5u⁴</td>
</tr>
</tbody>
</table>

(Working)

<table>
<thead>
<tr>
<th></th>
<th>P</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>At first</td>
<td>120u</td>
<td>60u</td>
</tr>
<tr>
<td>Change</td>
<td>-220</td>
<td>-40</td>
</tr>
<tr>
<td>In the end</td>
<td>20p</td>
<td>20p</td>
</tr>
</tbody>
</table>

W (at first) = 120u
W (left) = 27u
W (left) = 27u – 9u
   = 18u

Evelyn had 48 arrows at first.

Question 6

<table>
<thead>
<tr>
<th>Case 1</th>
<th>W</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change</td>
<td>-6</td>
<td>-27</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Case 2</th>
<th>W</th>
<th>M</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change</td>
<td>-12</td>
<td>-27</td>
</tr>
</tbody>
</table>

There were 54 people at the exhibition.

Question 7

C : A
4 : 1
3 : 1
16 : 4

At first
C : W : M + C : W : M + C
16 : 3 : 1 : 17 : 1 : 7

Difference (at first) = 27u – 9u
   = 18u

W (left) = 27u – 17u
   = 10u
10u = 10 × 4
   = 40

40 women left the room.
Answers to Review Questions on Chapter 7

Question 8 (Cont.)

$$11u - 8u = 3u$$

$$3u = 65 - 5$$

$$= 60$$

$$1u = 60 + 3$$

$$= 20$$

Case 1: $8u + 65 = 8 \times 20 + 65$

$$= 225$$

Case 2 (check): $11u + 5 = 11 \times 20 + 5$

$$= 225$$

Natasha has 225 coloured pencils.

Question 9

$$G : B : I$$

$$1 \times 15 : 3 \times 15 : 4 \times 15 : 7 \times 15 : 3 \times 10 : 10 \times 15$$

$$30 : 60 : 21 : 9 : 30$$

Boys in Island Junior (end) = $\frac{130}{100} \times 45u$

$$= 58.5u$$

Girls moved from Emerald Junior = $\frac{1}{3} \times 21u$

$$= 7u$$

Girls in Island Junior (end) = $15u + 7u$

$$= 22u$$

Difference in boys (end) = $58.5u - 9u$

$$= 49.5u$$

$$49.5u = 396$$

$$1u = 396 \div 49.5$$

$$= 8$$

Total in Island Junior (end) = $58.5u + 22u$

$$= 80.5u$$

$$80.5u = 80.5 \times 8$$

$$= 644$$

644 children were at Island Junior in the end.

Question 10

$$\frac{2}{3} J \text{ (thrice)} = \frac{2}{3} J \text{ (Make numerator of Jonas to be thrice that of Gordan)}$$

$$\frac{5}{10} J \text{ (thrice)} = \frac{5}{10} J$$

$$J : G : M$$

$$10^{10} : 7^{10} : 3^{10} : 5^{10}$$

$$30 : 21 : 9 : 30$$

Summary

$$J : G : M$$

$$30 : 21 : 50$$

Total = $30u + 21u + 50u$

$$= 101u$$

$$101u = 202$$

$$1u = 202 \div 101$$

$$= 2$$

$$J (30u) = 30 \times 2$$

$$= 60$$

$$G (21u) = 21 \times 2$$

$$= 42$$

$$M (50u) = 50 \times 2$$

$$= 100$$

Jonas, Maddox and Gordon had 60, 42 and 100 cards respectively.

Question 11

(Actual) | $2 | $5 |
---|---|---|
Case 1 | 12u | 7u |
Change | $-20$ | $+15$ |
Case 2 | 4p | 5p |
(Working) | $2$ | $5$ |
Case 1 | 60u | 28u |
Change | $-100$ | $+60$ |
Case 2 | 20p | 20p |

$$32u = 60 + 100$$

$$= 160$$

$$1u = 160 \div 32$$

$$= 5$$

No. of $2$-notes (at first) = $12u$

$$= 12 \times 5$$

$$= 60$$

No. of $5$-notes (at first) = $7u$

$$= 7 \times 5$$

$$= 35$$

Total value = $60 \times 2 + 35 \times 5$

$$= 295$$

Michelle had $295$ at first.

Question 12

(Actual) | S | E |
---|---|---|
Case 1 | 1u$^{10}$ | 7u |
Change | $+5$ | $-11$ |
Case 2 | 1p$^{10}$ | 5p |
(Working) | S | E |
Case 1 | 5u | 7u |
Change | $+25$ | $-11$ |
Case 2 | 5p | 5p |

$$W$$

$$M$$

$$2u = 25 + 11$$

$$= 36$$
Answers to Review Questions on Chapter 7

Question 12 (Cont.)

1u = \frac{36}{2} = 18

Stamps (at first) = 1u + 5
= 18 + 5 = 23

Envelopes (at first) = 7u
= 7 \times 18 = 126

Difference = 126 – 23 = 103

Angelica had 103 more envelopes than stamps.

Answers to Unit 8.1

Let’s Get Started 8.1

1. Volume of cuboid = Length \times Breadth \times Height
   = 25 \text{ cm} \times 9 \text{ cm} \times 12 \text{ cm}
   = 2700 \text{ cm}^3

2. Volume of cuboid = Length \times Breadth \times Height
   = 8 \text{ cm} \times 7 \text{ cm} \times 18 \text{ cm}
   = 1008 \text{ cm}^3

3. Volume of cuboid = Length \times Breadth \times Height
   = 32 \text{ cm} \times 32 \text{ cm} \times 40 \text{ cm}
   = 40960 \text{ cm}^3

Ask Yourself

1. Explore the different ways in which the small boxes can be orientated to fit into the big box.

Let’s Practise 8.1

Question 1

Greatest number of blocks that fits its length = \frac{20}{6} = 3R2 \text{ cm}

Greatest number of blocks that fits its width = \frac{16}{8} = 2

Greatest number of blocks that fits its height = \frac{10}{4} = 2R2 \text{ cm}

Total number of wooden blocks = 3 \times 2 \times 2 = 12

Anna can pack 12 wooden blocks into the box.

Question 2

Number of cubes that fits its length = \frac{32}{2} = 16

Number of cubes that fits its width
= 23 \div 2
= 11R1 \text{ cm} (use the least whole number value only)

Number of cubes that fits its height
= 13 \div 2
= 6R1 \text{ cm} (use the least whole number value only)

Total number of cubes = 16 \times 11 \times 6
= 1056

1056 2-cm cubes can fit into the box.

Answers to Unit 8.1

Question 3

80% = 0.8
Height of cuboid = 0.8 \times 19 \text{ cm}
= 15.2 \text{ cm}

Volume = 19 \text{ cm} \times 19 \text{ cm} \times 15.2 \text{ cm}
= 5487.2 \text{ cm}^3

The volume of cuboid is 5487.2 \text{ cm}^3.

Question 4

Volume of 1 cube = 7 \text{ cm} \times 7 \text{ cm} \times 7 \text{ cm}
= 343 \text{ cm}^3

Number of cubes that make up the solid = 6

Volume of solid = 6 \times 343 \text{ cm}^3
= 2058 \text{ cm}^3

(a) The volume of the solid figure is 2058 \text{ cm}^3.

Area of 1 face = 7 \text{ cm} \times 7 \text{ cm}
= 49 \text{ cm}^2

Number of faces on the surface = 6 + 6 + 12
= 24

Total surface area solid = 24 \times 49 \text{ cm}^2
= 1176 \text{ cm}^2

(b) The total surface area of the solid figure is 1176 \text{ cm}^2.

Question 5

\begin{align*}
H : L : B \\
130 : 100 : 120 & : 100 \\
13^{16} : 10^{16} & : 6^{13} : 5^{13} \\
78 : 60 & : 78 : 65
\end{align*}

Summary

\begin{align*}
H : L : B \\
78 : 60 & : 65
\end{align*}

Height = 78u

78u = 39 \text{ cm}

1u = 39 \text{ cm} \div 78
= 0.5 \text{ cm}

60u = 60 \times 0.5 \text{ cm}
= 30 \text{ cm}

65u = 65 \times 0.5 \text{ cm}
= 32.5 \text{ cm}

Volume = 30 \text{ cm} \times 32.5 \text{ cm} \times 39 \text{ cm}
= 38025 \text{ cm}^3

The volume of the cuboid is 38025 \text{ cm}^3.

Question 6

Total number of edges = 20

Length of one edge = 120 \text{ cm} \div 20
= 6 \text{ cm}

Volume of one cube = 6 \text{ cm} \times 6 \text{ cm} \times 6 \text{ cm}
= 216 \text{ cm}^3
Answers to Unit 8.1

Question 6 (Cont.)
Volume of solid = \( 3 \times 216 \text{ cm}^3 \)
= 648 \text{ cm}^3

The volume of solid is 648 \text{ cm}^3.

Question 7
Number of cubes that make up solid = 30
Volume of 1 cube = 3 cm \times 3 cm \times 3 cm
= 27 \text{ cm}^3

Volume of figure = 30 \times 27 \text{ cm}^3
= 810 \text{ cm}^3

(a) The volume of the solid figure is 810 \text{ cm}^3.

(b) Since the figure is placed on the floor when the paint is poured onto the solid, the faces at the bottom of the solid will not be coated with paint. So, only 11 cubes will have only 2 of its faces coated with paint.

Answers to Unit 8.2

Let’s Get Started 8.2

(a) Volume of water = 42 cm \times 22 cm \times 8 cm
= 7392 \text{ cm}^3
= 7 \ell 392 \text{ mℓ}

Capacity = 42 cm \times 22 cm \times 15 cm
= 13 860 \text{ cm}^3
= 13.86 \ell

(b) Height of water = \( \frac{8}{24} \times 24 \text{ cm} \)
= 19.2 cm

Volume of water = 35 cm \times 10 cm \times 19.2 cm
= 6720 \text{ cm}^3
= 6 \ell 72 \text{ mℓ}

Capacity = 35 cm \times 10 cm \times 24 cm
= 8400 \text{ cm}^3
= 8.4 \ell

(c) Volume of water = 17 cm \times 17 cm \times 5 cm
= 1445 \text{ cm}^3
= 1 \ell 445 \text{ mℓ}

Capacity = 17 cm \times 17 cm \times 17 cm
= 4913 \text{ cm}^3
= 4.913 \ell

(d) \( 3u = 3 \text{ cm} \)
\( 1u = 3 \text{ cm} \div 3 \)
= 1 cm

\( 7u = 7 \times 1 \text{ cm} = 7 \text{ cm} \)

Volume of water = 10 cm \times 10 cm \times 7 cm
= 700 \text{ cm}^3
= 0 \ell 700 \text{ mℓ}

Capacity = 10 cm \times 10 cm \times 10 cm
= 1000 \text{ cm}^3
= 1 \ell

Let’s Practise 8.2

Ask Yourself
1. Yes. Both refers to the height of saline in the canister. ‘20% filled with saline’ refers to the amount of saline in the canister ‘at first’ and \( \frac{1}{2} \text{ full} \) refers to the amount of saline in the canister ‘in the end’.

2. The fraction \( \frac{1}{2} \) refer to half of the height of the rectangular canister.

Change in height of cooking oil = \( \frac{7}{24} - \frac{3}{8} \)
= \( \frac{7}{24} \)

\( \frac{7}{24} \) of total = 2.1 ℓ

\( \frac{3}{8} \) of total = 2.1 ℓ \div 7
= 0.3 ℓ

Unfilled = 1 \- \( \frac{3}{8} \)
= \( \frac{5}{8} \)

\( \frac{5}{8} \) of total = 8 \times 0.3 ℓ
= 2.4 ℓ

2.4 litres more cooking oil would be needed to completely fill the container.

Question 2

Amount of water in fish tank
= \( \frac{4}{7} \times 80 \text{ cm} \times 50 \text{ cm} \times 28 \text{ cm} \)
= 64 000 \text{ cm}^3
= 64 ℓ

Amount of water left in container
= 68.02 ℓ \- 64 ℓ
= 4.02 ℓ
= 4 ℓ 20 mℓ

4 ℓ 20 mℓ of water is left in the cylindrical container.

Question 3

Volume of water in Container M
= 5 cm \times 10 cm \times 24 cm
= 1200 \text{ cm}^3
5u = 1200 \text{ cm}^3
1u = 1200 \text{ cm}^3 \div 5
= 240 \text{ cm}^3
2u = 2 \times 240 \text{ cm}^3
= 480 \text{ cm}^3
= 480 mℓ

(a) 480 mℓ of water was poured into Container N.

Height of water in Container N = \( \frac{8}{24} \times 24 \text{ cm} \)
= 9.6 cm

Page 72 For more review questions, please visit www.onsponge.com. 101115
Answers to Unit 8.2

**Question 3 (Cont.)**

Height of water remained in Container M = 24 cm – 9.6 cm = 14.4 cm

(b) The height of the water level in Container M is **14.4 cm**.

**Question 4**

Volume of water in container at first
= \(\frac{3}{4} \times 700 \text{ cm}^3\)
= 525 cm\(^3\)

Volume of water poured into tank
= 525 cm\(^3\) ÷ 2
= 262.5 cm\(^3\)

Volume of water in tank at first
= 5 cm × 5 cm × 9 cm
= 225 cm\(^3\)

Total volume of water in tank, end
= 225 cm\(^3\) + 262.5 cm\(^3\)
= 487.5 cm\(^3\)
= 487.5 mℓ

There was **487.5 mℓ** of water in the tank now.

**Question 5**

5 pails = 60 cm × 60 cm × 0.25 cm
= 900 cm\(^3\)

1 pail = 900 cm\(^3\) ÷ 5
= 180 cm\(^3\)
= 180 mℓ

(a) Each pail can hold **180 mℓ** of petrol.

Height of petrol in the container at first
= 0.3 × 60 cm
= 18 cm

Amount of petrol left in container
= 60 cm × 60 cm × (18 cm – 0.25 cm)
= 63 900 cm\(^3\)
= 63.9 ℓ

Time taken to completely drained the petrol
= 63.9 ℓ ÷ 3 ℓ/min
= 21.3 min

(b) It would take **21.3 min** to drain the petrol completely from the container.

**Question 6**

Volume of orange juice dispensed out
= 15 min × 200 mℓ/min
= 3000 mℓ
= 3 ℓ

Amount of orange juice left in dispenser
= 5.7 ℓ – 3 ℓ = 2.7 ℓ

Percentage left = \(\frac{2.7}{5.7} \times 100\%\)
= 47.37\% (2 d.p.)

(a) **47.37\%** of the orange juice in the cylindrical dispenser was left. 

Amount of orange juice in container in the end
= \(\frac{3}{4} \times 18 \text{ cm} \times 18 \text{ cm} \times 18 \text{ cm}\)
= 3888 cm\(^3\)
= 3.888 ℓ

Amount of orange juice in container at first
= 3.888 ℓ – 3 ℓ
= 0.888 ℓ

(b) There was **0.888 ℓ** of orange juice in the container at first.

**Answers to Unit 8.2**