Online Solutions
For P5 ThinkingMath@onSponge

Note: In all solutions, U represents Units

Chapter 1 Whole Numbers

Unit 1.1 – Whole Numbers

Qn 4

<table>
<thead>
<tr>
<th>Jerry</th>
<th>20</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tommy</td>
<td>20</td>
<td>+40 +20</td>
</tr>
</tbody>
</table>

1 unit → $20 + $40 + $20 = $80
Jerry at first → 1 unit + $60 → $80 + $60 = $140

Unit 1.2 – More Than/Less Than (External Unchanged)

Qn 3

<table>
<thead>
<tr>
<th>Dennis</th>
<th>1 unit</th>
<th>-30</th>
<th>120</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jean</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2 units → 30
1 unit → 15
Dennis at first → 1 unit + 150 → 15 + 150 → 165

Unit 1.3 – Equal Stage (Beginning/End)

Qn 4

Rakesh 1 unit -24
Xijie 1 unit 24 +60
2 units + 84 → 216
2 units → 132
1 unit → 132 + 2 → 66
Rakesh at first → 66

Unit 1.4 – Constant Difference Between Individuals

Qn 3

Girls

Boys

2 → 60
→ 30
No. of pupils who left midway → (120 - 30) x 2 → 90 x 2 → 180

Unit 1.5 – Number of Units x Value of Units

Qn 4

<table>
<thead>
<tr>
<th>Girls</th>
<th>No. of pupils</th>
<th>x drinks/person</th>
<th>Total packet</th>
</tr>
</thead>
<tbody>
<tr>
<td>3 units</td>
<td>3</td>
<td>9 units</td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td>1 unit</td>
<td>5 units</td>
<td></td>
</tr>
</tbody>
</table>

Total amount → 5 units + 9 units = 14 units
14 units → 350
1 unit → 350 + 14 → 25
Total number of boys → 1 unit → 25

Qn 5

End
Calvin → 48
Daniel → 2 x 48 → 96
Difference → 48

At first
Daniel

Calvin

2 → 48
→ 24
Daniel at first → 3 → 3 x 24 → 72

Unit 2.1 – Part-Whole Relationship (Type 1)

Qn 4

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>muffins</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>5</td>
<td>cakes</td>
</tr>
<tr>
<td>2</td>
<td>10</td>
<td>left</td>
</tr>
</tbody>
</table>

1 muffin cost → 1 unit
1 cake cost → 3 units
5 cakes cost → 15 units

3 total → 15 units
10
1 total → 5 units
10
5 total → 25 units = 25 muffins
10

Chapter 2 Fractions

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Qn 5

\[
\begin{align*}
\text{wife} & \quad \frac{2}{5} \\
\text{remain} & \quad \frac{3}{5} \\
\text{(\$1200)} & \quad \frac{2}{3} \\
\text{remainder} & \rightarrow \$1200 \\
\text{remainder} & \rightarrow \$600 \\
\end{align*}
\]

\[
\text{Remainder} \rightarrow \$1800 \rightarrow \frac{3}{5} \text{ total} \\
\text{Total} \rightarrow \$600 \times 5 \rightarrow \$3000
\]

Qn 6

\[
\begin{align*}
\text{boys} & \quad \frac{1}{3} \\
\text{swim} & \quad \frac{3}{5} \\
\text{girls} & \quad \frac{2}{3} \\
\text{don't swim} & \quad \frac{3}{5} \\
\text{swim} & \quad \frac{2}{5} \\
\text{Total swimmers} & \rightarrow \frac{3}{15} + \frac{4}{15} \rightarrow 490 \\
\text{Total} & \rightarrow 70 \times 15 = 1050 \text{ pupils}
\end{align*}
\]

Unit 2.2 – Part-Whole Relationship (Type 2)

Qn 5

\[
\begin{align*}
\text{Cycling} & \quad \text{Swimming} \\
\text{15} & \quad \text{15} \\
\text{3 total} & \rightarrow \text{2} \\
\text{1 total} & \rightarrow \text{6} \\
\end{align*}
\]

Since \( \frac{1}{4} \text{ total} \rightarrow 2 \]

Unit 2.3 – Part-Whole Relationship (Type 3)

Qn 5 (Cont.)

\[
\begin{align*}
\begin{array}{c}
\text{2 total} + \$15 \\
\text{1 remainder} + \$30 \text{ (plates)} \\
\text{2 total} - \$15 \\
\text{1 remainder} - \$30 \text{ ($120)} \\
\end{array}
\end{align*}
\]

\[
\begin{align*}
\text{remainder} & \rightarrow \$120 + \$30 \rightarrow \$150 \\
\text{remainder} & \rightarrow \$75 \rightarrow \$75 \\
\text{Remainder} & \rightarrow 75 \times 3 \rightarrow \$225 \\
\text{3 total} \rightarrow \$225 \rightarrow \$225 \\
\text{1 total} \rightarrow \$80 \\
\text{Total} \rightarrow 80 \times 5 \rightarrow \$400
\end{align*}
\]

Unit 2.4 – Equal Fractions

Qn 3

\[
\begin{align*}
\frac{3}{5} \text{ Boys} & \rightarrow \frac{4}{7} \text{ Girls} \\
\frac{12}{20} \text{ Boys} & \rightarrow \frac{12}{21} \text{ Girls} \\
\text{Boys} & \rightarrow \text{20 units} \\
\text{Girls} & \rightarrow \text{21 units} \\
\text{Difference} & \rightarrow \text{1 unit} \rightarrow 65 \\
\text{Total in the end} & \rightarrow 24 \times 65 \rightarrow 1560 \text{ pupils}
\end{align*}
\]

Qn 4

Left amount

\[
\begin{align*}
\text{Rasidah} & \rightarrow \frac{2}{5} & \text{Chai Seng} & \rightarrow \frac{1}{7} \\
\frac{1}{7} \text{ Chai Seng} & \rightarrow \frac{1}{2} \text{ of what Rasidah left} \\
\frac{1}{7} \text{ Chai Seng} & \rightarrow \frac{1}{2} \times \frac{2}{5} \text{ Rasidah} \\
\frac{1}{7} \text{ Chai Seng} & \rightarrow \frac{1}{5} \text{ Rasidah}
\end{align*}
\]
Qn 4 (Cont.)
Chai Seng → 7 units
Rasidah → 5 units
Difference → 2 units → $48
1 unit → $24
Total (Raidah) at first → 5 units
→ 5 x $24
= $120

Qn 6
Roy → 3 units
Dennis → 4 units
→ Twice x
3
1 Roy
4
3
→ 6 units
8
Dennis → 8 units
Roy → 9 units
Total 17 units → $340
1 unit → $20
Dennis in the end → 6 units
→ 6 x $20
→ $120

Unit 2.5 – Repeated Identity
Qn 4
Boys : Girls
1 unit : 5 units
Children (6 units)

Adults : Children
2 units : 3 units
x2
3
x2
Boys : Girls : Adults
1 unit : 5 units : 4 units
Difference between adults and boys
→ 3 units
→ 120
1 unit → 40
Total → 10 units
→ 10 x 40 → 400

Qn 6
Square : Rectangle
2 units : 5 unit
x2
x2
Unshaded : Shaded
Square
1 units : 3 units
Unshaded : Shaded : Unshaded
Square
1 unit : 3 units : 7 units
Thus total unshaded units → 8
Area of unshaded units given → 72cm²
1 unit → 72 / 8 = 9
Area of square → 4 units
Area → 4 x 9cm² → 36 cm²

Unit 2.6 – External Unchanged
Qn 3
Boys : 2 units x 3 → 6 units
Girls : 3 units x 3 → 9 units
Boys : 3 units x 2 → 6 units
Girls : 5 units x 2 → 10 units
Increase in girls → 1 unit → 4
No. of pupils in the end → 16 units
→ 16 x 4 → 64

Qn 6
Syrup : Water
1 unit : 2 units → 2 units : 4 units
x2
x2
Syrup : Water
2 units : 5 units
x6
Increase in water → 1 unit → 200 ml
Amount of water at first → 4 units
→ 4 x 200 → 800 ml

Unit 2.7 – Unchanged Total
Qn 4
After 1 hour
Answered 1 unit x 5 → 5 units
Unanswered 1 unit x 5 → 5 units
After 20 minutes
Answered 4 units x 2 → 8 units
Unanswered 1 unit x 2 → 2 units
Transfer → 3 units → 18
1 unit → 6
Total questions in quiz → 10 units
→ 10 x 6 → 60

Qn 5
Terry : Chelsia
7 units
Chelsia + Dave 3 units x 7 → 21 units
Chelsia : 2 units x 4 → 8 units
Terry + Dave 5 units x 4 → 20 units
Terry : Chelsia : Dave
7 units : 8 units : 13 units
Difference between Terry and Dave
6 units → $24
1 unit → $4
Cost of present → 28 units → 28 x 4
= $112

Qn 6
Benson + Daryl 3 units x 5 → 15 units
Jean 1 unit x 5 → 5 units
Daryl + Jean 3 units x 4 → 12 units
Benson 2 units x 4 → 8 units
Benson : Daryl : Jean
8 units : 7 units : 5 units
Difference between Benson and Jean
3 units → $36
1 unit → $12
Total sum shared → 20 units
→ 20 x 12
→ $240
Unit 2.8 – Constant Difference

Qn 4
At first
Jenny 1 unit x 2 → 2 units
Daryl 2 units x 2 → 4 units
Difference 1 unit x 2

End
Jenny → 1 unit
Daryl → 3 units
Difference → 2 units
Decrease each → 1 unit → 12
Jenny in the end → 1 unit → 12

Qn 5
At first
Shop A → 68 kg
Shop B → 128 kg
Difference → 60 kg

End
Shop A → 2 units
Shop B → 5 units
Difference → 3 units
3 units → 60 kg
1 unit → 20 kg
Shop A (end) → 2 units → 40 kg
Shop A (sold) → 68 kg - 40 kg → 28 kg
Total sold → 28 kg x 2 = 56 kg

Qn 6
Square 2 unit x 4 → 8 units
Rectangle 5 units x 4 → 20 units
Difference 3 units x 4
Unshaded square 1 unit x 3 → 3 units
Unshaded rect 5 units x 3 → 15 units
Difference 4 units x 3
Decrease each 5 units → 1 unit → 40 cm²
Total area of figure → 3 units + 15 units + 5 units → 23 units → 23 x 8 → 184 cm²

Unit 2.9 – Number of Units x Value of Units

Qn 2
Red : Yellow Red : Green
1 unit : 3 units 2 units : 5 units
x2 x2
No. x value → Total weight
Red 2 units x 10g → 20g units
Yellow 6 units x 15g → 90g units
Green 5 units x 20g → 100g units
Total 210g units → 3150g
1 unit → 15
Total green marbles → 5 units → 5 x 15 → 75

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Unit 2.9 – Number of Units x Value of Units

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Chapter 3 Ratio

Unit 3.1 – Part-Whole Relationship

Qn 6

Christine : Doris

$45

\[ \frac{1}{5} \text{ total} \rightarrow 2 \]

\[ \frac{4}{5} \text{ total} \rightarrow 8 \]

Total \rightarrow 10 \rightarrow 10 \times 5 \rightarrow 50

Unit 3.2 - Repeated Identity

Qn 3

Unshaded Sq : Shaded sq

3 units : 4 units

Shaded rect : Unshaded rect
2 units : 7 units

Shaded area 4 units \rightarrow 16 \text{ cm}^2

Area of figure \rightarrow 3 \text{ units} + 4 \text{ units} + 14 \text{ units}

\[ \rightarrow 21 \text{ units} \]

\[ \rightarrow 21 \times 4 = 84 \text{ cm}^2 \]

Unit 3.3 – External Unchanged

Qn 3

At first

Pears : Apples
3 units : 4 units

End

Pears : Apples
1 unit : 2 units
X3 \times 3

3 units : 6 units

Increase in apples \rightarrow 2 \text{ units} \rightarrow 12

\rightarrow 1 \text{ unit} \rightarrow 6

Total \rightarrow 7 \text{ units} \rightarrow 7 \times 6 \rightarrow 42

Unit 3.4 – Unchanged Total

Qn 5

A \text{ unit} \times 4

C + D \text{ 4 units} \times 4

T + C + D

16 \{ T \text{ 3 units} \times 2

C + D \text{ 5 units} \times 2

10 \{ C \text{ 3 units}

D \text{ 7 units}

A : 7

C : 3 units

D : 7 units

\text{Difference between A and C}

\rightarrow 3 \text{ units} \rightarrow $12

\rightarrow 1 \text{ unit} \rightarrow $4

\text{Cost of present} \rightarrow 20 \text{ units}

\rightarrow 20 \times $4 \rightarrow $80

Unit 3.5 – Constant Difference

Qn 5

At first

Square 1 unit \times 5 \rightarrow 5 \text{ units}

Rectangle 3 units \times 5 \rightarrow 15 \text{ units}

Difference 2 units \times 5

End

Unshaded Square \rightarrow 2 \text{ units} \times 2 \rightarrow 4 \text{ units}

Unshaded Rectangle \rightarrow 7 \text{ units} \times 2 \rightarrow 14 \text{ units}

Difference \rightarrow 5 \text{ units} \times 2

\text{Decrease each} \rightarrow 1 \text{ unit} \rightarrow 20 \text{ cm}^2

\text{Area of square} \rightarrow 5 \text{ units} \rightarrow 5 \times 20

\rightarrow 100 \text{ cm}^2

Length = 10 \text{ cm}

Unit 3.6 – Number of Units x Value of Units

Qn 3

Difference in cost \rightarrow 1 \text{ unit} \rightarrow $3

Cost of 1 plate \rightarrow 3 \text{ units} \times $9

Cost of 1 cup \rightarrow 2 \text{ units} \times $6

\text{No.} \times \text{value} \rightarrow \text{Total sales}

\text{Plates} 3 \text{ units} \times $9 \rightarrow $27 \text{ units}

\text{Cups} 5 \text{ units} \times $6 \rightarrow $30 \text{ units}

\text{Total} \rightarrow $57 \text{ units}

\rightarrow $2850

1 \text{ unit} \rightarrow 50

(a) No. of plates sold in 1\textsuperscript{st} month

\rightarrow 3 \text{ units} \rightarrow 3 \times 50 \rightarrow 150

(b) Items sold \rightarrow 4 \text{ total} \rightarrow 8 \text{ units}

\rightarrow 8 \times 50

\rightarrow 400

\rightarrow 3 \text{ total} \rightarrow \text{items left}

\rightarrow 300

$45
Unit 3.7 – External Changed (Model)

Qn 6

\[
\begin{align*}
7 \times \left\{ \begin{array}{l}
2 \text{ units} \quad 3 \text{ units} \\
10 \quad 5
\end{array} \right\} \times 6 \\
7 \times 6 \text{ parts} \quad 7 \text{ parts} \times 6 \\
\end{align*}
\]

\[
\begin{array}{c|c|c}
\text{Daryl} & 14 \text{ units} & 70 \\
\text{Bernard} & 18 \text{ units} & 30
\end{array}
\]

Daryl

\[4 \text{ units} \quad \rightarrow \quad 100 \]
\[1 \text{ unit} \quad \rightarrow \quad 25 \]

No. of stickers Daryl had at first → 2 units → 2 \times 25 → 50

Chapter 4 Average

Unit 4.3 - Average with Unknown Quantity

Qn 3

Difference in Gareth's results = 13 + 5 = 18 mark
Difference in average score = 90 - 87 = 3 marks
Total people involved = 18 + 3 = 6
Excluding Gareth himself, he had 5 friends.

Qn 7

Difference in the individual score = 18 + 9 = 27 points
Difference in average score = 85 - 82 = 3 points
No. of pupils in the group = 27 + 3 = 9

Qn 9

Total distance = 8.50 \times 4 = 34m
Ukraine + Germany = 34m - 8.95m - 7.35m = 17.7m
(a) Smallest difference = 9m - 8.7m = 0.3m
(b) Biggest difference = 9.7m - 8m = 1.7m

Unit 4.4 – Average with Repeated Identity

Qn 2

Total of John + Henry → $2400 \times 2 = $4800
Total of Henry + Bernard → $3000 \times 2 = $6000

Difference between John and Bernard
→ 2 units → $(6000-4800) = $1200
1 unit → $600
John → 5 units → 5 \times $600 = $3000
Henry's salary → $4800 - $3000 = $1800

Qn 5

Total (Amos + Bernard) = $2800 \times 2 = $5600
Total (Bernard + Chelsia) = $4200 \times 2 = $8400
Total (Amos + Chelsia) = $2600 \times 2 = $5200

Twice the total of Amos + Bernard + Chelsia = $5200 + $8400 + $5600 = $19200
Total amount = $19200 + 2 = $19202
Average of A + B + C = $9600 + 3 = $3200

Chapter 5 Rate

Unit 5.1 Rate Involving One Object

Qn 5

5 lessons → $125
1 lesson → $125 ÷ 5 → $25
16 lessons → 16 \times $25 → $400

Qn 6

In a day, Johnny paint \( \frac{1}{8} \) house, Alan paint \( \frac{1}{10} \) house
Together, they paint \( \frac{1}{8} + \frac{1}{10} = \frac{5}{40} + \frac{4}{40} = \frac{9}{40} \)
\( \frac{9}{40} \) house take both 1 day, \( \frac{1}{40} \) house take both \( \frac{1}{9} \) day
The whole house will take both \( \frac{40}{9} \) days = \( \frac{4}{9} \)

Unit 5.2 – Rate Involving Two Different Objects

Qn 2

In 1 hour, Johny can paint \( \frac{1}{6} \) house
Together, Johny and Ramesh can paint \( \frac{1}{3} \) house
Ramesh alone can paint \( \frac{1}{3} - \frac{1}{6} = \frac{1}{6} \) house
\( \frac{1}{6} \) house take Ramesh 1 hour
\( \frac{6}{1} \) Whole house will take Ramesh 6 hours

Unit 5.3 – Rate Involving Three Different Objects

Qn 2

In an hour, 1\textsuperscript{st} tap fills \( \frac{1}{4} \) tank, 2\textsuperscript{nd} tap fills \( \frac{1}{3} \) tank
In 1 hour, both fill \( \frac{1}{4} + \frac{1}{3} = \frac{3}{12} + \frac{4}{12} = \frac{7}{12} \) tank
Left → \( \frac{5}{12} \) tank

In 1 hour, 3\textsuperscript{rd} tap drains \( \frac{1}{2} \) tank
With 1\textsuperscript{st} and 3\textsuperscript{rd} taps turned on → \( \frac{1}{2} \cdot \frac{1}{4} \)
= \( \frac{1}{8} \) tank was drained

Time taken to completely drain tank → \( \frac{7}{12} + \frac{1}{4} \)
= \( \frac{7 \times 4}{12} + \frac{3}{12} \)
= \( \frac{2}{3} \) hour
Chapter 6 Angles I

Unit 6.1 – Angles on a Straight Line

Qn 3
80° - 60° = 120°
8 units → 120°
1 unit → 15°
∠y = 5 units → 5 x 15° = 75°
∠x = 3 units → 3 x 15° = 45°

Unit 6.2 – Vertically Opposite Angles

Qn 3
∠x + ∠y = 120° (vertically opposite ∠)
3 units → 120°
1 unit → 40°
∠x = 2 units → 2 x 40° = 80°
∠y = 1 unit → 1 x 40° = 40°

Qn 6
∠x = 42° (vertically opposite angle)
∠y = 180° - 83° - 42° = 55° (angle on straight line)

Unit 6.3 – Alternate, Corresponding & Interior Angles

Qn 3
∠z = 180° - 56° - 34° = 90° (angle on straight line)
2x = 180° - 34° - 90° (alternate angle) = 56°
x = 28°
3y = 180° - 90° (alternate angle) = 90°
y = 30°

Qn 8
∠BEG = 60° (alternate angle)
∠x = 60° + 2 = 30° (angle bisector)
∠z = 180° - 30° = 150° (interior angle)
∠y = 180° - 30° - 55° = 95°

Unit 6.4 – Isosceles Triangle

Qn 3
∠PQR = 55° (isosceles ∆)
∠PRQ = 180° - 55° - 55° (sum of ∆) = 70°
∠PRS = 180° - 70° (angle on straight line) = 110°
∠SRT = 180° - 110°
= 70° (angle on straight line)
∠RST = 180° - 70° - 70° = 40°

Qn 7
180° - 75° = 55°
180° - 30° - 30° = 120°
∠y = 360° - 120° = 240°
∠x = 55° - 30° = 25°

Qn 9
∠PQR = 55° (isosceles ∆)
∠PRQ = 180° - 55° - 55° (sum of triangle) = 70°
∠PRS = 180° - 110° (angle on straight line) = 70°
∠SRT = 180° - 110° - 70° = 40° (angle on straight line)
∠RST = 180° - 70° - 70° = 40° (isosceles ∆)

Chapter 7 Angles II (Closed Figures)

Unit 7.1 – Interior and Exterior Angles Within A Triangle

Qn 4
∠y = 42° + 54°
= 96° (2 internal ∠ = 1 external ∠)
180° - 96° = 84°
∠x = 180° - 84° - 20° = 76°

Qn 5
∠a + ∠b + 20° = ∠c + ∠d + 20° = 180° (sum of ∠s in ∆)
∠a + ∠b + ∠c + ∠d = (180° x 2) - 20° - 20° = 360° - 40° = 320°

Qn 7
∠WUV = ∠b + ∠d (2 internal ∠ = 1 external ∠)
∠UWV = ∠a + ∠c (2 internal ∠ = 2 external ∠)
∠a + ∠b + ∠c + ∠d + 20° = 180° (sum of ∆)
∠a + ∠b + ∠c + ∠d = 160°

Qn 8
∠a + ∠b + ∠c + ∠d + ∠e + ∠f = (180° x 3) - 180° = 360°
Since the sum of ∠ of ∆RSV = 180°

Unit 7.2 – Angle Properties Within A Rhombus

Qn 2
∠QPB = 180° - 114° = 66°
(a) ∠QPR = 66° - 33°
(b) = 2
(c) ∠QCB = 96°
∠RSC = 180° - 84° - 33° = 63°

Qn 3
∠ADC = 180° - 130° = 50°
∠x = 50° - 25°

Qn 4
180° - 45° - 90° - 30° = 15°
∠x = 15°

Qn 7
∠FBD = 180° - 70° - 45° = 65°
∠x = 65° + 2 = 32.5°
∠BDE = 180° - 65° = 115°
70° + ∠y = 115° (2 internal ∠ = 1 external ∠)
∠y = 115° - 70° = 45°

Qn 10
∠DAO = 45° (diagonal of square)
∠DAE = 180° - 90° - 60° = 30° (sum of ∆)
∠y = 45° - 30° = 15°
∠x = 15° + 90° = 105° (2 internal ∠ = 1 external ∠)

Unit 7.3 – Angles Properties Within a Parallelogram

Qn 2
∠x = 25° (alternate ∠)
∠y = 42° + 25°
= 67° (2 internal ∠ = 1 external ∠)
∠z = 180° - 80° - 42° - 25° = 33° (sum of ∆)
Unit 7.4 – Angle Properties Within A Trapezium

Qn 2

\[ 180° - 118° = 62° \text{ (on straight line)} \]
\[ \angle y = 180° - 84° - 62° = 34° \text{ (sum of \triangle)} \]
\[ \angle x = 34° \text{ (alternate \angle)} \]

Unit 7.5 – Angle Properties Within a Circle

Qn 3

\[ \angle BCD = 48° \text{ (alternate \angle)} \]
\[ 3X = 48° + 48° \text{ (2 internal \angle = 1 external \angle)} \]
\[ X = 32° \]

Qn 5

\[ \angle AOC = 180° - 60° = 120° \text{ (interior \angle)} \]
\[ \angle a + \angle b + \angle c + \angle d = 360° - 120° = 240° \text{ (sum of \angle of 2\triangle)} \]

Unit 8.1 – Area of Triangle

Qn 8

Area of shaded \triangle BCD
\[ = \left( \frac{1}{2} \times 20 \times CE \right) = \left( \frac{1}{2} \times 16 \times 15 \right) \]
\[ CE = \frac{16 \times 15}{20} = 12 \text{ cm} \]

Qn 10

Area of shaded \triangle ABC
\[ = \left( \frac{1}{2} \times 12 \times AB \right) = \left( \frac{1}{2} \times 28 \times 18 \right) \]
\[ AB = \frac{28 \times 18}{12} = 42 \text{ cm} \]

Unit 8.2 – Finding the Area of a Triangle in Unit Squares

Qn 3

(a) Shaded
\[ = (6 \times 6) - \left( \frac{1}{2} \times 4 \times 2 \right) - \left( \frac{1}{2} \times 3 \times 2 \right) - \left( \frac{1}{2} \times 3 \times 1 \right) - \left( \frac{1}{2} \times 4 \times 2 \right) \]
\[ = 36 - 4 - 3 - 1.5 - 4 = 23.5 \text{ cm}^2 \]

(b) Shaded
\[ = (6 \times 6) - \left( \frac{1}{2} \times 5 \times 4 \right) - (4 \times 2) - \left( \frac{1}{2} \times 2 \times 2 \right) - \left( \frac{1}{2} \times 6 \times 1 \right) \]
\[ = 36 - 10 - 8 - 2 - 3 = 13 \text{ cm}^2 \]
Qn 6 (Cont.)

Shaded triangle = \(1 - \frac{1}{4} - \frac{1}{4} - \frac{1}{8}\)
\[= \frac{3}{8}\] square ABCD
\[= \frac{3}{8} \times 48\text{cm}^2 = 18\text{ cm}^2\]

Qn 7

Area of shaded triangle = \(\frac{1}{2} \times 7 \times 5 = 17.5\text{cm}^2\)

Unit 8.4 – Triangles with Common Bases

Qn 2

Area of shaded parts = \(\frac{1}{2} \times 20 \times 12 = 120\text{cm}^2\)

Qn 3

Since the 2 \(\triangle\)s share the same base AC
BE : DF = Area of \(\triangle\) ABC : Area of \(\triangle\) ADC
\[= 1 : 3\]
Difference in area = shaded part
\[= 2 \text{ units} \rightarrow 64\text{ cm}^2\]
\[1 \text{ unit} \rightarrow 32\text{ cm}^2\]
\[\frac{1}{2} \times AC \times BE = 32\text{ cm}^2\]
\[\frac{1}{2} \times AC \times 4 = 32\text{ cm}^2\]
\[\frac{1}{2} AC = 32 + 2 = 16\text{cm}\]

Unit 8.5 – Composite Figures Involving Triangles

Qn 2

Area of 1 triangle = \(\frac{1}{2} \times 8 \times 20 = 80\text{ cm}^2\)

Area of 8 triangles = \(60\text{cm}^2 \times 8 = 480\text{cm}^2\)

Qn 4

\[ \text{P + R} \rightarrow \frac{1}{2} \text{ rectangle ABCD} = \text{Q + S} \]
\[ \text{S} \rightarrow 24\text{cm}^2 + 45\text{cm}^2 - 20\text{cm}^2 = 49\text{cm}^2\]

Chapter 9 Percentage

Unit 9.1 – More than in Percentage

Qn 5

10% of $60 = \frac{10}{100} \times 60 = $6
Total bill $66
Each friend pays $66 ÷ 3 = $22

Qn 6

Boys \rightarrow 125\% (5 units)
Girls \rightarrow 100\% (4 units)
Difference 1 unit \rightarrow 12
Total 9 units \rightarrow 9 \times 12 \rightarrow 108

Unit 9.2 – Less Than In Percentage

Qn 4

Men \rightarrow 75\% (3 units)
Women \rightarrow 100\% (4 units)
Difference 1 unit \rightarrow 50
Total \rightarrow 7 \text{ units} \rightarrow 7 \times 50 \rightarrow 350

Qn 5

Green \rightarrow 30\% (3 units)
Blue \rightarrow 100\% (10 units)
Difference 7 units \rightarrow 28
1 unit \rightarrow 4
Total green \rightarrow 3 \text{ units} \times 3 \times 4 \rightarrow 12

Qn 7

Boys \rightarrow 25\% (1 unit)
Girls \rightarrow 100\% (4 units)
\% Difference \rightarrow \frac{4 \text{ units} - 1 \text{ unit}}{1 \text{ unit}} \times 100\% = 300\%

Unit 9.3 – Multiplication in Percentage

Qn 7

Chinese : Malay : English
\[\frac{4}{5} : \frac{3}{5} : \frac{6}{5}\]
Total \rightarrow 13 \text{ units} \rightarrow 3900
1 unit \rightarrow 300
Chinese \rightarrow 2 \times 300 \rightarrow 1200
Malay \rightarrow 3 \times 300 \rightarrow 900
English \rightarrow 6 \times 300 \rightarrow 1800

Increase in Chinese \rightarrow \frac{20}{100} \times 1200 = 240
Increase in Malay \rightarrow \frac{10}{100} \times 900 = 90
Increase in English \rightarrow 510 - 240 - 90 = 180
\% increase in English \rightarrow \frac{180}{1000} \times 100\% = 18\%

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Qn 10

Length → 20cm
Breadth → 16cm

Area → 20 x 16 = 320 cm²

Increase in length → 25 x 20cm = 5cm
Increase in breadth → 25 x 16cm = 4cm

New length → 25cm
New breadth → 20cm
New area → 25 x 20 = 500cm²

% increase in area → \frac{500 - 320}{320} x 100% = 56.25%

Qn 12

April

→ Spend 75%
→ Save 25%

May

→ Spend 75% x 120 = 90%
→ Save 30%

Increase in spending → 90% - 75% → 15% → $450
→ 1% → $30

Salary in May → $3600

Unit 9.4 – Overlapping Percentage

Qn 4

100% - 16% = 84%
82% + 54% = 136%

Percentage of pupils who do not like any of the 2 sports → 136% - 84% = 52%

No. of pupils who enjoyed both swimming and jogging

\[ \frac{52}{100} x 200 = 104 \]

Unit 9.5 – Profit and Loss

Qn 4

20% - 5% = 15%
15% of selling price → $75 - $30 → $45
1% of selling price → $3
95% of selling price → $95 x $3 → $285
Cost price → $285 - $75 → $210

OR

80% of selling price → $80 x 3 → $240
Cost price → $240 - $30 → $210

Unit 9.6 – Part-Whole Relationship

Qn 3

\[ \frac{3}{5} = \frac{24}{40} \]

\[ \frac{2 x 1}{5} = \frac{2}{20} = \frac{4}{40} \]

\[ \frac{2 x 3}{5} x \frac{1}{2} = \frac{6}{40} \]

(a) Fraction on money left

\[ \frac{6}{40} = \frac{3}{20} \]

(b) \[ \frac{6}{40} - \frac{9}{20} = \frac{18}{40} \]

\[ \frac{1}{20} \]

\[ \frac{6}{40} \]

Total → $4 x 20 → $80

Qn 6

$30 plates

\[ \frac{65}{20} \]

\[ \frac{13}{20} \]

65%TV\left(\frac{13}{20}\right)

\[ \frac{1}{5} + \frac{7}{20} = \frac{4}{7} \]

\[ \frac{7}{20} \]

\[ \frac{3}{7} \]

\[ \frac{1}{5} \]

Total → $30

\[ \frac{1}{7} \]

Total → $10

Total → $70

Qn 9

50% total + $15 game cartridge

50% total - $15
(Remainder)

60% remainder + $8 handphone accessories

40% remainder - $8

$10

40% remainder → $18
20% remainder → $9
Remainder → $9 x 5 → $45
50% total → $45 + $15 → $60
Total → $60 x 2 → $120
Qn 12

45% total + $31 shoes

25% remainder + $20 Skirt

55% total - $31

75% remainder - $20

75% remainder → $150
1% remainder → $2
Remainder → $200
55% total → $200 + $31 → $231
5% total → $231 + 11 → $242
100% total → $21 x 20 → $420

Unit 9.7 – Equal Fractions

Qn 3

40% of boys → 10% of girls
2 of boys → 1 of girls
5 → 20

2 of boys → 2 of girls
5 → 20

Boys → 5 units

Girls → 20 units

Difference → 15 units → 510
1 unit → 34

Total pupils in the end → 4 units
→ 4 x 34 → 136

Qn 5

Chocolate left is equal to twice cheese left
20% chocolate → 2 x 25% cheese
20% chocolate → 50% cheese
1 chocolate → 1 cheese
5 → 2

Total → 7 units → 350
1 unit → 50

Total chocolate muffins given away → 4 units → 4 x 50 → 200

Unit 9.8 – External Unchanged

Qn 2

At first
Children : 40% (2 units) x 3 → 6 units
Adults : 100% (5 units) x 3 → 15 units

End
Children : 60% (3 units) x 2 → 6 units
Adults : 40% (2 units) x 2 → 4 units

Decrease in adults → 11 units → 22
1 unit → 12

Total children in the bus → 6 x 2 → 12

Qn 4

At first
Girls : 40% (2 units) x 3 → 6 units
Boys : 60% (3 units) x 3 → 9 units

End
Girls : 55% (11 units)
Boys : 45% (9 units)

Increase in girls → 5 units → 20
1 unit → 4

No. of boys at telematch → 9 units → 9 x 4 → 36

Online Solutions for P5 Conquer Problem Sums (Updated 5 May 2011)
Chapter 10 Volume

Unit 10.1 – Finding Volume of a Cuboid with Given Dimension

Qn 3
Capacity of tank = L x B x H
= 30cm x 20 cm x 12cm
= 7200cm³

Qn 7
Volume of water = L x B x H
= \( \frac{2}{3} \times 18 \text{ cm} \times 18\text{ cm} \times 24\text{ cm} \)
= 2592cm³

Qn 11
Breadth = \( \frac{1}{4} \times 200\text{ cm} = 50\text{ cm} \)
Height = \( \frac{1}{2} \times 50\text{ cm} = 25\text{ cm} \)
Capacity of tank = L x B x H
= 220cm x 50 cm x 25cm
= 250,000cm³ = 250 litre

Unit 10.2 – Finding Dimension with Given Volume

Qn 5
Volume of water = L x B x H
2880cm³ = 3 units x 3 units x 5 units
Therefore 1 unit x 1 unit x 1 unit
= \( \frac{2880}{3x3x5} = 64\text{ cm}³ \)
1 unit = 4cm
Since (4 x 4 x 4) = 64
Area of base = 3 units x 3 units
= (3 x 4) x (3 x 4) = 144cm²

Unit 10.3 – Length, Area and Volume of Cubes

Qn 3
Since L x B x H = 125
and L = B = H
L = 5cm
Area of shaded face = L x B = 5cm x 5 cm = 25cm²

Qn 5
Volume X : Volume Y = 27 : 1
Volume Y → 1 unit → 1cm³
Volume X → 27 units → 27cm³
Edge of cube X → 3cm
Since (3 x 3 x 3) = 27

Qn 8
Length C : Length D
= 3 : 4
Volume C : Volume D
= (3 x 3 x 3) : (4 x 4 x 4)
= 27 : 64
Volume D → 64 units → 128cm³
→ 1 unit → 2cm³
Volume C → 27 x 2 → 54cm³

Online Solutions for P5 Conquer Problem Sums (Updated 5 May 2011)
Unit 10.4 – Volume and Area of Unit Cubes

Qn 7
Front : 8 faces
Back : 8 faces
Left : 9 faces
Right : 9 faces
Top : 10 faces
Bottom : 10 faces
Total : 54 faces
Total area to be painted = 54 x 1cm² = 54cm²

Unit 10.5 – Volume = Base Area x Height

Qn 4
Total volume → 3.5 x 1000 x 5 x 60 = 1 050 000cm³
Depth at first → \( \frac{1,050,000}{125 \times 84} \) = 100cm

Qn 6
Volume of water leaked → (400 + 300) x 6 = 4 200cm³
Depth at first → \( \frac{4200}{60 \times 10} \) = 7cm
New height → 15cm - 7cm = 8cm

Qn 8
Length : Breadth : Height
3 : 2 : 5 : 4
\times 5 \times 5 \times 2 \times 2
15 : 10 : 10 : 8

Height → 8 cm x 2 = 16cm
8 units → 16cm
1 unit → 2 cm
Length → 15 units → 15 x 2 cm = 30 cm
Breadth → 10 units → 10 x 2 cm = 20 cm
Capacity → L x B x H → 30cm x 20cm x 16cm = 9600cm³

Unit 10.6 – Volume Involving Displacement

Qn 4
\( \frac{2}{3} \) tank = 3600cm³
\( \frac{1}{3} \) tank = 1800cm³
Total tank = 1800cm³ x 3 = 5400cm³

Base area = \( \frac{5400}{60} \) = 90cm²

Qn 7
Space in tank = (50 x 20 x 35) – (3 x 10 x 10 x 10)
= 32 000cm³

(a) Time needed to fill the tank
\( \frac{32,000 \text{cm}³}{8,000 \text{cm}³/\text{min}} \) = 4 min

(b) Decrease in depth = \( \frac{2 \times 10 \times 10}{50 \times 20} \)
= 2cm
Depth of water = 35cm – 2cm = 33cm

Unit 10.7 Volume with Common Base or Height

Qn 2
When height is the same,
Ratio of volume → ratio of base area
Base area A : Base area B
= (25 x 12) : (20 x 20)
= 300 : 400
3 : 4
Volume A : Volume B
→ 3 : 4

Volume of A = 25cm x 12cm x 21cm = 6300cm³
7 units → 6300cm³
1 unit → 900cm³
3 units → 2700cm³
Height = \( \frac{2700 \text{cm}³}{25 \text{cm} x 12 \text{cm}} \) = 9cm

Qn 5
3 units → 24cm
1 unit → 8cm

Base area of container B = \( \frac{160 \text{cm}³}{8 \text{cm}} \) = 20cm²

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