Marks: /60

Time: 1 hour 30 minutes

Name: ....

Date: ....

INSTRUCTIONS TO CANDIDATES

Section A (30 marks)

Time: 45 minutes

1. Answer **all** the questions in this section.
2. Calculators may **not** be used in this section.
3. All working must be clearly shown. Omission of essential working will result in loss of marks.
4. The marks for each question is shown in brackets [   ] at the end of each question.

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1 **(a)** Express the ratio 900 g to 1.35 kg in its simplest form. Give your answer in the form $m : n$ where m and n are integers.

   (b) Given that $x : 8 = 3 : 5$, find the value of x.

   (c) When y is multiplied by 1.25 it becomes z. Express $y : z$ as a ratio in its simplest form.

Answer (a) .... [1]

   (b) x = ... [1]

   (c) .... [1]

2 (a) The enrolment of students in a language school consists of 1200 local students and 50 foreign students. If 700 of the students are boys, find the ratio of the number of girls to the total number of students in the school.

(b) If it takes Wendy twice as long to earn $12 as it takes Ben to earn $5, find the ratio of Wendy's pay per hour to Ben's pay per hour.

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4

</div>

Answer (a) .... [1]

(b) .... [1]

3 (a) Mr Jacobs divided a sum of money among his three children Anita, Bobby and Cindy in the ratio 7 : 9 : 12. If Cindy received $60 more than Anita, calculate the sum of money.

(b) There are $3x$ red and green paper clips in a box. The ratio of the number of red clips to the number of green clips is 4 : 3. If there are 24 red clips, find the value of x.

Answer (a) $ .... [2]

(b) $x =$ .... [1]

4 **(a)** Tommy is paid $6 an hour. If he works overtime he is paid $8.80 an hour. If he works 10 hours on a certain day, of which $2\frac{1}{4}$ hours is overtime, calculate how much he earns that day.

(b) John earns $280 for working 40 hours. Calculate
    (i) how much he will earn in 12 hours,
    (ii) how many hours he will need to work in order to earn $133.
   (Assume the same rate of pay per hour.)

Answer (a) $ .... [2]

    (b) (i) $ .... [1]

        (ii) .... h [1]

5 (a) To make a special cocktail, 0.015 g of colouring is added to one litre of the cocktail. Calculate the mass of colouring needed to make 500 litres of the cocktail.

   (b) In a certain recipe, $2\frac{1}{4}$ cups of flour are needed to make a cake that serves 9 people. If Mrs Tan wants to use the same recipe to make a cake for 12 people, how many cups of flour does she need?

Answer (a) .... g [1]

(b) .... cups [1]

6 The diagram shows a plot of land *ABCD* in the shape of a trapezium. The plot of land is divided into two plots, *P* and *Q* such that the ratio of the area of *P* to the area of *Q* is 3 : 5. Given that $AD = 36$ m, $BC = 20$ m and $BE = 12$ m, calculate the area of *Q*.
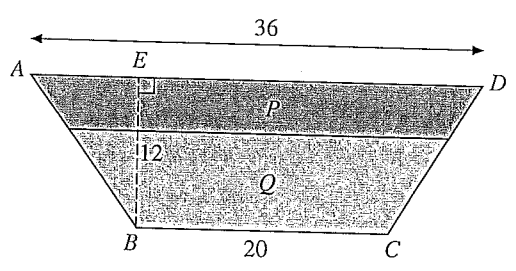
Answer .... m^2 [3]

7   12 men take 20 days to renovate a shophouse. Assuming that they work at the same rate, find
     (a) how many days would it take 15 men to renovate a similar shophouse,
     (b) how many men would be needed to renovate two such shophouses in 30 days.

Answer (a) .... days [1]

(b) .... men [2]

8   A model of an aeroplane is made using a scale of 1 : 50.
     (a) If the model of the aeroplane is 90 cm long, calculate the actual length of the aeroplane.
     (b) If the wingspan of the actual aeroplane is 38 m long, calculate the wingspan of the model.

Answer (a) .... m [1]

(b) .... cm [1]

9 **(a)** At the Departure Lounge in Changi Airport, a row of clocks indicating the time in different countries show that the time in London is 13 00 when it is 21 00 in Singapore.

   (i) What would the time in London be when it is 10 30 in Singapore?

   (ii) A tourist travelling on a flight departing for London leaves Singapore at 10 30. If the flight takes 13 h 45 min, calculate the local time in London when the plane arrives.

(b) Belinda cycled from home at an average speed of 8.4 km/h to the Post Office which was 5.6 km away. If she arrived at the Post Office at 12 15, at what time did she leave her house?

Answer (a) (i) .... [1]

(ii) .... [1]

(b) .... [2]

Test 11: Ratio, Rate and Proportion

10 (a) A taxi is travelling at an average speed of 20 m/s. Express its speed in km/h.

(b) A motorist travels 54 km in $1\frac{1}{2}$ hours and then travels at a constant speed of 72 km/h for a further $\frac{1}{2}$ hour.

Calculate

(i) the average speed of the motorist for the first $1\frac{1}{2}$ hours,

(ii) the average speed of the motorist for the whole journey.

Answer (a) .... km/h [1]

(b) (i) .... km/h [1]

(ii) .... km/h [2]

INSTRUCTIONS TO CANDIDATES

Section B (30 marks)

Time: 45 minutes

1. Answer **all** the questions in this section.
2. Calculators may be used in this section.
3. All working must be clearly shown. Omission of essential working will result in loss of marks.
4. The marks for each question is shown in brackets [   ] at the end of each question.

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11 Three manufacturers of plastic products, A, B and C received an order to make 1950 plastic filters in the ratio $7 : 8 : 11$.

   (a) Find the number of plastic filters A and C are supposed to make respectively.

   (b) If each manufacturer is paid 85 cents per filter made, calculate the amount of money B will receive.

   (c) If D, another manufacturer of plastic products is called to help speed up the process by making 338 of the plastic filters required above, find the number of filters finally made by A, B and C respectively.

Answer (a) A: .... filters [1]

C: .... filters [1]

(b) $ .... [2]

(c) A: .... filters

B: .... filters

C: .... filters [2]

12 (a) If it takes 16 taps 10 hours to fill 8 tanks, how long will it take 12 taps to fill 9 tanks?

(b) Machine *A* can produce 80 bolts per minute while Machine *B* can produce only 50 bolts per minute. Only Machine *A* is used initially to make the bolts but it breaks down after $8\frac{1}{2}$ minutes. Machine *B* is then used to complete the job. If the job requires 1000 bolts, how long does the whole operation take?

(c) Carol takes 5 hours to sew buttons on a batch of uniforms. Betty will take 7 hours to sew buttons on the similar batch of uniforms. How long will it take both of them, working together to complete sewing the buttons on the similar batch of uniforms? Give your answer in hours and minutes.

Answer (a) .... h [2]

(b) .... min [2]

(c) .... h .... min [2]

13 **(a)** A car uses 14 l of petrol to travel 126 km. If 1 litre of petrol costs $1.14, find the cost of petrol needed to travel a distance of 189 km.

(b) A man parked his car in a multi-storey carpark at 08 25 and collects it at 15 05 on the same day.

    (i) How long was his car parked in the carpark?

    (ii) If the parking charges are $1.50 for the first hour and 90 cents for each subsequent half hour or part thereof, how much must he pay for parking his car there?

(c) Anne, Paul and Theresa shared a sum of money. Anne received $\frac{1}{3}$ of the sum. Paul and Theresa shared the remainder in the ratio 5 : 3. Find the ratio in which the sum of money was shared among the three children.

Answer (a) $ .... [2]

    (b) (i) .... h .... min [1]

      (ii) $ .... [2]

    (c) .... [2]

14 5 cm on a map represents an actual distance of 2 km.

    (a) A plot of land is represented on the map by a rectangle of length 8 cm and breadth 3 cm. Find the actual perimeter of the plot of land in kilometres.

    (b) Two towns are 8 km 80 m apart. Calculate, in centimetres, their distance apart on the map.

    (c) Express the scale of the map in the form 1 : n.

Answer (a) .... km [1]

(b) .... cm [3]

(c) .... [2]

15 (a) A bus left Town A at 23 45 on Saturday to travel to Town B which was 260 km away. The bus was travelling at an average speed of 60 km/h.

    (i) When did the bus arrive in Town B?

    (ii) On the return journey, the bus left at 08 45 and arrived at Town A at 13 57. Calculate the average speed of the bus on the return journey.

(b) A motorist takes $3\frac{3}{4}$ hours to travel from Singapore to Malacca at an average speed of V km/h. If he increases his speed by 8 km/h, he will reach Malacca half an hour earlier. Find the value of V.

Answer (a) (i) .... [1]

(ii) .... km/h [2]

(b) V = ... [2]

Test 11: Ratio, Rate and Proportion

Section A

1. (a)

$$1.35 \text{ kg} = 1.35 \times 1000 \text{ g}$$
$$= 1350 \text{ g}$$
$$900 : 1350 = \textbf{2 : 3}$$

(b) $x : 8 = 3 : 5$

$$\frac{x}{8} = \frac{3}{5}$$
$$x = \frac{3}{5} \times 8$$
$$= \frac{24}{5}$$
$$= \textbf{4}\frac{\textbf{4}}{\textbf{5}}$$

(c) $1.25y = z$

$$\frac{5}{4}y = z$$
$$\frac{y}{z} = \frac{4}{5}$$
$$y : z = \textbf{4 : 5}$$

2. (a) Total no. of students = 1200 + 50 = 1250
No. of girls = 1250 − 700 = 550
Required ratio = 550 : 1250
= **11 : 25**

(b)

Ratio of Wendy's hourly rate to Ben's hourly rate
= 12 : 10
= **6 : 5**

3. (a) 7 + 9 + 12 = 28
12 − 7 = 5
5 units — $60

$$1 \text{ unit} — \frac{\$60}{5} = \$12$$

28 units — 28 × $12 = $336
∴ the sum of money is **$336**.

(b) 4 units — 24 clips

$$1 \text{ unit} — \frac{24}{4} = 6 \text{ clips}$$

7 units — 7 × 6 = 42 clips
∴ there are 42 red and green clips
$3x = 42$

$$x = \frac{42}{3} = \textbf{14}$$

4. (a) No. of hours at basic rate of $6
$$= 10 - 2\frac{1}{4}$$
$$= 7\frac{3}{4}$$

Amount earned at basic rate
$$= 7\frac{3}{4} \times \$6$$
$$= \frac{31}{\cancel{4}_2} \times \$\cancel{6}^{3}$$
$$= \$\frac{93}{2}$$
$$= \$46.50$$

Amount earned at overtime rate of $8.80
$$= 2\frac{1}{4} \times \$8.80$$
$$= \frac{9}{\cancel{4}_1} \times \$\cancel{8.80}^{2.20}$$
$$= \$19.80$$

Total amount earned that day
= $46.50 + $19.80
= **$66.30**

(b) (i) 40 hours of work = $280
$$1 \text{ hour of work} = \frac{\$280}{40} = \$7$$
12 hours of work = 12 × $7 = $84
∴ he will earn **$84** in 12 hours.

(ii) To earn $280, he works 40 hours.
To earn $1, he works $\frac{40}{280} = \frac{1}{7}$ hours.
To earn $133, he will need to work $133 \times \frac{1}{7}$
= **19 hours.**

5. (a) 1 litre of cocktail requires 0.015 g of colouring.
500 litres of cocktail require 500 × 0.015 = **7.5 g** of colouring.

(b) Let x be the number of cups of flour she needs to make a cake for 12 people.

x cups : $2\frac{1}{4}$ cups = 12 people : 9 people

$$\frac{x}{2\frac{1}{4}} = \frac{12}{9}$$

$$x = \frac{12}{9} \times 2\frac{1}{4}$$

$$= \frac{\cancel{12}^{3}}{\cancel{9}_{1}} \times \frac{\cancel{9}^{1}}{\cancel{4}_{1}}$$

$$= 3$$

∴ she needs **3 cups of flour**.

6. Area of trapezium $ABCD$

$$= \frac{1}{\cancel{2}_{1}} \times \cancel{12}^{6} \times (36 + 20)$$

$$= 6 \times 56$$

$$= 336 \ m^2$$

$3 + 5 = 8$

8 units — 336 m²

1 unit — $\frac{336}{8}$ = 42 m²

5 units — 5 × 42 = 210 m²

∴ the area of Q is **210 m²**.

7. (a) Let x represent the number of days it would take 15 men to renovate the similar shophouse.

12 men ↔ 20 days

15 men ↔ x days

$15 \times x = 12 \times 20$

$15x = 240$

$x = \frac{240}{15} = 16$

∴ 15 men would take **16 days** to renovate the similar shophouse.

Teacher's Tip

As the number of men needed to renovate the house increases, the number of days needed decreases. So the number of men renovating the house is inversely proportional to the number of days needed.

(b) Let y represent the number of men needed to renovate one such shophouse in 30 days.

12 men ↔ 20 days

y men ↔ 30 days

$y \times 30 = 12 \times 20$

$30y = 240$

$y = \frac{240}{30} = 8$

∴ it will take 8 men to renovate one such shophouse in 30 days.

∴ it will take 8 × 2 = **16 men** to renovate two such shophouses in 30 days.

8. (a) Length of actual aeroplane : Length of model = 50 : 1

Length of actual aeroplane : 90 cm = 50 cm : 1 cm

∴ length of actual aeroplane = $\frac{50 \ cm}{1 \ cm} \times 90 \ cm$

$= 4500 \ cm$

$= \mathbf{45 \ m}$

(b) Wingspan of model : Wingspan of actual aeroplane = 1 : 50

Wingspan of model : 38 m = 1 m : 50 m

Wingspan of model = $\frac{1 \ m}{50 \ m} \times 38 \ m$

$= 0.76 \ m$

$= \mathbf{76 \ cm}$

9. (a) (i)   21 00 (Singapore)
   − 13 00 (London)
   ――――――――――
     8 00 (Difference)

Singapore is 8 hours ahead of London.

∴ when it is 10 30 in Singapore,

it is 10 30 − 08 00 = **02 30** in London.

(ii) Departure time in Singapore is 10 30.

Departure time in London is 02 30 (From part (a).]

Travelling time = 13 hours 45 minutes

  ^{1}
  02 30 (Departure time)
+ 13 45 (Travelling time)
――――――――――――
  16 15 (Arrival time)

∴ the local time in London when the plane arrives is **16 15**.

(b) Total time taken = $\frac{\text{Total distance travelled}}{\text{Average speed}}$

$= \frac{5.6 \ km}{8.4 \ km/h}$

$= \frac{2}{3} \ h$

$= 40 \ min$

  $^{11} \ ^{75}$
  $\cancel{12} \ \cancel{15}$ (Arrival time)
− 00 40 (Journey time)
――――――――――――
  11 35 (Departure time)

∴ she left her house at **11 35**.

Teacher's Tip

The formula to find the average speed is

Average speed = $\frac{\text{Total distance travelled}}{\text{Total time taken}}$

The formula can be rewritten to find the total time taken and the total distance travelled.

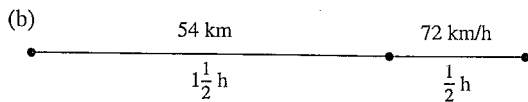Total time taken = $\frac{\text{Total distance travelled}}{\text{Average speed}}$

Total distance travelled = Average speed × Total time taken

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10. (a) 20 m $= \dfrac{20}{1000}$ km, 1 h $= 3600$ s

In 1 second, the taxi travels $\dfrac{20}{1000}$ km.

In 1 hour, the taxi travels $\left(\dfrac{20}{1000} \times 3600\right)$ km

$\qquad\qquad\qquad\qquad = 72$ km

∴ its average speed is **72 km/h.**

(b)

$\underset{1\frac{1}{2}\,\text{h}}{\overset{54\ \text{km}}{\bullet\!-\!-\!-\!-\!-\!-\!\bullet}}\ \underset{\frac{1}{2}\,\text{h}}{\overset{72\ \text{km/h}}{-\!-\!-\!-\!-\!\bullet}}$

(i) Average speed for 1st $1\dfrac{1}{2}$ h

$= \dfrac{\text{Total distance travelled}}{\text{Total time taken}}$

$= \dfrac{54\ \text{km}}{1\frac{1}{2}\,\text{h}}$

$= \left(\overset{18}{\cancel{54}} \times \dfrac{2}{\cancel{3}_1}\right)$ km/h

$= \mathbf{36\ km/h}$

(ii) Total distance travelled in next $\dfrac{1}{2}$ h

$=$ Average speed $\times$ Total time taken

$= 72\ \text{km/h} \times \dfrac{1}{2}\ \text{h}$

$= 36$ km

Average speed for whole journey

$= \dfrac{(54 + 36)\ \text{km}}{\left(1\frac{1}{2} + \frac{1}{2}\right)\text{h}}$

$= \dfrac{90}{2}$ km/h

$= \mathbf{45\ km/h}$

▓▓ Section B ➤

11. (a) $7 + 8 + 11 = 26$

26 units — 1950 plastic filters

$\quad$ 1 unit — $\dfrac{1950}{26} = 75$ plastic filters

No. of plastic filters A is supposed to make

$= 7 \times 75$

$= \mathbf{525}$

No. of plastic filters C is supposed to make

$= 11 \times 75$

$= \mathbf{825}$

(b) No. of plastic filters B is supposed to make

$= 8 \times 75$

$= 600$

Amount of money B will receive

$= 600 \times 85\cent$

$= \mathbf{\$510}$

(c) No. of filters made by A, B and C finally

$= 1950 - 338$

$= 1612$

26 units — 1612 plastic filters

$\quad$ 1 unit — $\dfrac{1612}{26} = 62$ plastic filters

No. of plastic filters A made finally

$= 7 \times 62$

$= \mathbf{434}$

No. of plastic filters B made finally

$= 8 \times 62$

$= \mathbf{496}$

No. of plastic filters C made finally

$= 11 \times 62$

$= \mathbf{682}$

12. (a) 16 taps take 10 hours to fill 8 tanks.

16 taps $\leftrightarrow$ 10 hours

12 taps $\leftrightarrow$ x hours $\quad$ ▨Inverse proportion▨

$x \times 12 = 10 \times 16$

$\qquad 12x = 160$

$\qquad\quad x = \dfrac{160}{12} = 13\dfrac{1}{3}$

∴ 12 taps take $13\dfrac{1}{3}$ h to fill 8 tanks.

8 tanks $\leftrightarrow$ $13\dfrac{1}{3}$ h

9 tanks $\leftrightarrow$ y h

$\dfrac{y}{13\frac{1}{3}} = \dfrac{9}{8}$ $\quad$ ▨Direction proportion▨

$\qquad y = \dfrac{9}{8} \times 13\dfrac{1}{3}$

$\qquad\quad = 15$

∴ 12 taps take **15 h** to fill 9 tanks.

(b) Machine A can produce 80 bolts per minute. (Given)

No. of bolts produced by Machine A in $8\dfrac{1}{2}$ minutes

$= 8\dfrac{1}{2} \times 80$

$= 680$

No. of bolts Machine B needs to make

$= 1000 - 680$

$= 320$

Machine B can produce 50 bolts per minute. (Given)

Time taken by Machine B to produce 320 bolts

$= \dfrac{320}{50}$

$= 6.4$ minutes

Total time taken for the whole operation

$= 8.5 + 6.4 = \mathbf{14.9\ minutes}$

(c) In x hours, Carol can sew $\dfrac{x}{5}$ of the buttons.

In x hours, Betty can sew $\dfrac{x}{7}$ of the buttons.

Together, they will complete sewing all the buttons on the batch of uniforms which is represented by 1.

$$\dfrac{x}{5} + \dfrac{x}{7} = 1$$

$$\dfrac{7x + 5x}{35} = 1$$

$$12x = 35$$

$$x = \dfrac{35}{12} = 2\dfrac{11}{12}$$

$$= \textbf{2 h 55 min}$$

13. (a) $14\ l \leftrightarrow 126$ km
$x\ l \leftrightarrow 189$ km

$$\dfrac{x}{14} = \dfrac{189}{126} \qquad \boxed{\text{Direct proportion}}$$

$$x = \dfrac{189}{126} \times 14$$

$$= 21$$

1 l of petrol costs \$1.14.

$\therefore$ 21 l of petrol cost $21 \times \$1.14 = \textbf{\$23.94}$.

(b) (i)
$$\begin{array}{r} \overset{14}{\cancel{15}}\ \overset{65}{\cancel{05}} \\ -\ 08\ \ 25 \\ \hline 06\ \ 40 \end{array}$$

His car was parked in the carpark for **6 h 40 min.**

(ii) Charges for 1st hour = \$1.50
6 h 40 min − 1 h = 5 h 40 min
$\approx$ 6 h or 12 half-hours

> **Teacher's Tip**
> The carpark charges after the 1st hour are applicable for every half-hour block, even though it isn't a full half-hour.

Total parking charges
$= \$1.50 + (12 \times 90¢)$
$= \$1.50 + \$10.80$
$= \textbf{\$12.30}$

(c) Fraction of money received by Paul and Theresa

$$= 1 - \dfrac{1}{3} = \dfrac{2}{3}$$

$$5 + 3 = 8$$

$$8 \text{ units} — \dfrac{2}{3}$$

$$1 \text{ unit} — \dfrac{2}{3} \times \dfrac{1}{8} = \dfrac{1}{12}$$

$$5 \text{ units} — 5 \times \dfrac{1}{12} = \dfrac{5}{12}$$

$$3 \text{ units} — 3 \times \dfrac{1}{12} = \dfrac{1}{4}$$

Fraction of money received by Paul $= \dfrac{5}{12}$

Fraction of money received by Theresa $= \dfrac{1}{4}$

Ratio of sum of money shared by Anne, Paul and Theresa

$$= \dfrac{1}{3} : \dfrac{5}{12} : \dfrac{1}{4} \qquad \boxed{\begin{array}{l}\text{Multiply all parts in the ratio}\\ \text{by 12, the LCM of 3, 12 and 4.}\end{array}}$$
$$= \textbf{4 : 5 : 3}$$

> **Teacher's Tip**
> You can divide or multiply all parts in a ratio by the same number to get an equivalent ratio.

14. (a) Perimeter of rectangle on the map
$= 2(8 + 3)$
$= 2 \times 11$
$= 22$ cm
5 cm represent 2 km.

1 cm represents $\dfrac{2}{5}$ km.

22 cm represent $22 \times \dfrac{2}{5}$ km = 8.8 km.

$\therefore$ the actual perimeter of the plot of land is **8.8 km.**

(b) 8 km 80 m = $8\dfrac{80}{1000}$ km = $8\dfrac{2}{25}$ km

2 km is represented by 5 cm on the map.

1 km is represented by $\dfrac{5}{2} = 2\dfrac{1}{2}$ cm on the map.

$8\dfrac{2}{25}$ km is represented by $8\dfrac{2}{25} \times 2\dfrac{1}{2} = 20.2$ cm

$\therefore$ the two towns are **20.2 cm** apart on the map.

(c) 2 km = 2000 m
$= 2000 \times 100$ cm
$= 200\,000$ cm
Hence the scale is 5 : 200 000 = **1 : 40 000**.

15. (a) (i) Total time taken $= \dfrac{\text{Total distance travelled}}{\text{Average speed}}$

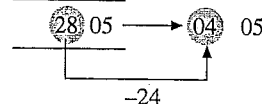$$= \dfrac{260 \text{ km}}{60 \text{ km/h}}$$

$$= 4\dfrac{1}{3} \text{ h}$$

$$= 4 \text{ h } 20 \text{ min}$$

(Starting time)   23 45
(Journey time)   +   04 20
(Arrival time)   28 05 $\longrightarrow$ 04   05
-24

$\therefore$ the bus arrived at Town B at **04 05** on **Sunday.**

(ii)   13 57   (Arrival time)
$\underline{-\ 08\ 45}$ (Starting time)
     05 12   (Journey time)

$\longrightarrow 5\frac{12}{60}$ h $= 5\frac{1}{5}$ h

Average speed $= \dfrac{\text{Total distance travelled}}{\text{Total time taken}}$

$= \dfrac{260 \text{ km}}{5\frac{1}{5}\text{ h}}$

$= 50$ km/h

∴ the average speed of the bus on the return journey is **50 km/h**.

(b)

Singapore •————————————• Malacca
$\qquad\qquad 3\frac{3}{4}$ h
$\qquad\qquad V$ km/h

Singapore •————————————• Malacca
$\qquad\quad 3\frac{3}{4} - \frac{1}{2} = 3\frac{1}{4}$ h
$\qquad\qquad (V+8)$ km/h

Let the distance from Singapore to Malacca be d km.
Total distance travelled
= Average speed × Total time taken

$d = V$ km/h $\times 3\frac{3}{4}$ h

$= 3\frac{3}{4}V$ km — (1)

$d = (V+8)$ km/h $\times 3\frac{1}{4}$ h

$= 3\frac{1}{4}(V+8)$

$= \left(3\frac{1}{4}V + 26\right)$ km — (2)

Equate (1) and (2):

$3\frac{3}{4}V = 3\frac{1}{4}V + 26$

$\frac{1}{2}V = 26$

$V = 26 \times 2$

$= 52$

Test 12: Arithmetical Problems

Section A

1. (a) $5\frac{1}{2}$% of 600 m

$= \dfrac{5\frac{1}{2}}{100} \times 600$ m

$= 33$ m

(b) 3 hours = (3 × 60) minutes
        = 180 minutes

Percentage required $= \dfrac{45}{180} \times 100\%$

$= 25\%$

Teacher's Tip
To express one quantity a as a percentage of another b:
(1) Write a as a fraction of b.
(2) Multiply the fraction $\frac{a}{b}$ by 100.
Note that a and b must be expressed in the same units.

(c) $12\frac{4}{5}\% = \dfrac{12\frac{4}{5}}{100}$

$= \dfrac{12.8}{100}$

$= 0.128$

Teacher's Tip
To convert a percentage into a decimal:
(1) Drop the % sign.
(2) Divide the numerator of the fraction by 100.

2. (a) Cost of painting in 2004
       = 115% of cost of painting in 2003

$\$690 = \dfrac{115}{100} \times$ Cost in 2003

Cost in 2003

$= \dfrac{100}{115} \times \$690$

$= \$600$

(b) Cost of camera after GST
    = 105% of $320

$= \dfrac{105}{100} \times \$320$

$= \$336$

3. (a) Selling price = 120% of $250

$= \dfrac{120}{100} \times \$250 = \$300$

(b) Selling price = 120% of cost price

$\$456 = \dfrac{120}{100} \times$ Cost price

Cost price $= \dfrac{100}{120} \times \$456 = \$380$

(c) Profit = 20% of cost price

$\$24 = \dfrac{20}{100} \times$ Cost price

Cost price $= \dfrac{100}{20} \times \$24$

$= \$120$

Selling price = Cost price + Profit
        $= \$120 + \$24 = \$144$