Class	Index Number	Candidate Name

ANG MO KIO SECONDARY SCHOOL
FINAL EXAMINATION 2018
SECONDARY TWO NORMAL TECHNICAL

MATHEMATICS SYLLABUS T **4046/01**
Paper 1

Wednesday **10 October 2018** **1 hour 30 minutes**

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Write your name, index number and class on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams or graphs.
Do not use staples, paper clips, glue or correction fluid.

Answer **all** questions.
If working is needed for any question it must be shown with the answer.
Omission of essential working will result in loss of marks.
The use of an approved scientific calculator is expected, where appropriate.
If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give answers in degrees to one decimal place.
For π, use either your calculator value or 3.142, unless the question requires the answer in terms of π.

The number of marks is given in brackets [ ] at the end of each question or part question.
The total of the marks for this paper is **50**.

For Examiner's Use
50

This document consists of **11** printed pages and **1** blank page.

Mathematical Formulae

Compound interest

$$\text{Total amount} = P\left(1+\frac{r}{100}\right)^n$$

Quadratic equation $ax^2+bx+c=0$

$$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$$

Geometry and Measurement

Curve surface area of a cone $= \pi rl$

Surface area of a sphere $= 4\pi r^2$

$$\text{Volume of a cone} = \frac{1}{3}\pi r^2 h$$

$$\text{Volume of a pyramid} = \frac{1}{3}\times \text{base area} \times \text{height}$$

$$\text{Volume of a sphere} = \frac{4}{3}\pi r^3$$

1 Express 987.5049

(a) 3 decimal places,

Answer ..... [1]

(b) 3 significant figures.

Answer ..... [1]

---

2 **(a)** Express the following ratio in its simplest form.

$$0.18 : 0.3$$

Answer ..... : ..... [1]

(b) Write in the missing value in the equivalent fraction given below.

$$\frac{28}{160} = \frac{7}{\square}$$

[1]

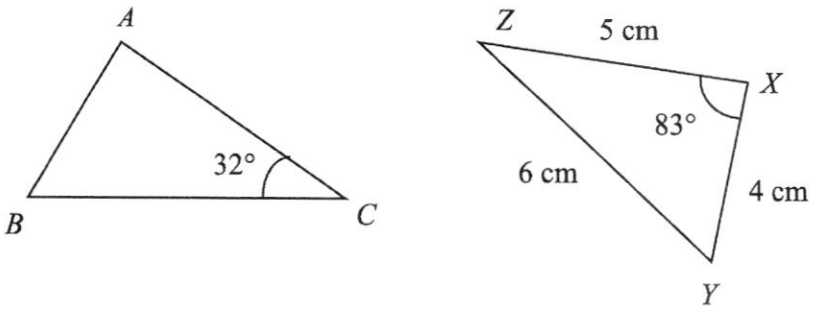
---

3 Convert 100 kilometres per hour into metres per second.

Answer ..... m/s [2]

---

4 Triangle ABC is congruent to triangle XYZ.



(a) Find the length of BC.

Answer ..... cm [1]

(b) Find angle ZYX.

Answer ..... ° [2]

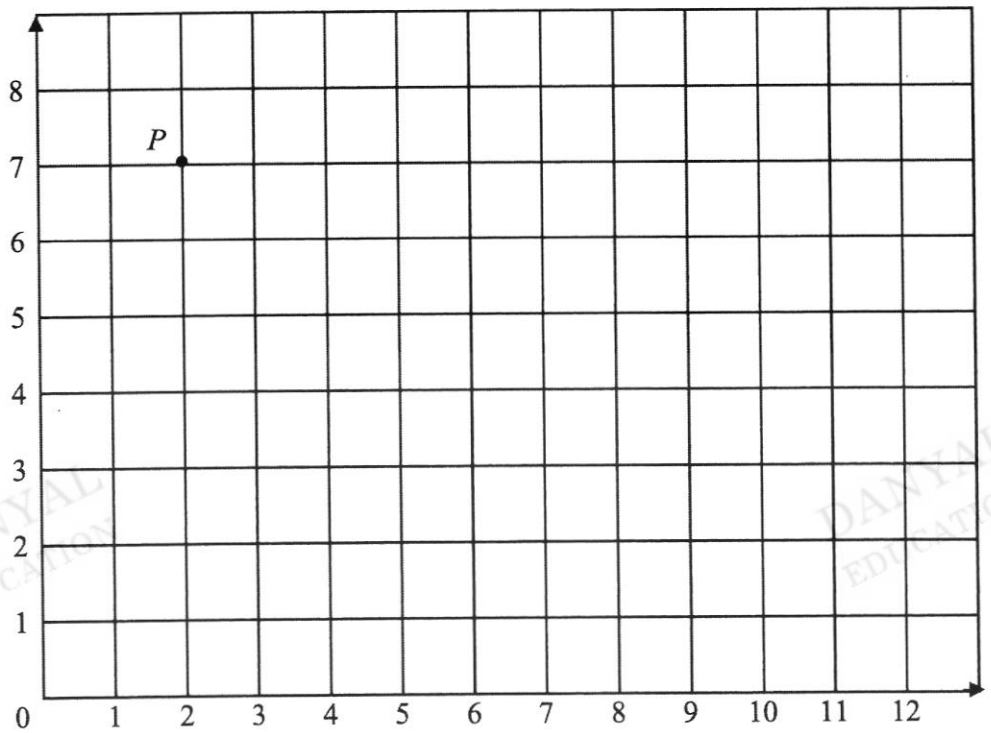
---

5 10 workers take 12 days to paint a block of flats.

If all workers paint at the same rate, how long would 8 workers take to paint the same block of flats?

Answer ..... days [2]

6



(a) Write down the coordinates of point P.

Answer (..... , ...) [1]

(b) Q is the point (8 , 1).

Label the point on the grid above. [1]

(c) Complete the table of values for $y = x + 1$.

x	0	1	2	3	4
y	1		3		5

[1]

(d) **(i)** Draw the graph of $y = x + 1$ on the grid above. [1]

(ii) Find the value of x when $y = 6$.

Answer $x =$ ..... [1]

7 The table below shows the number of stalks of sunflowers sold at a florist last week.

Day	**No. of stalks of sunflowers sold**
Monday to Friday	$2x$ per day
Saturday	$x + 40$
Sunday	$3x - 5$

(a) What was the total number of stalks of sunflowers sold last week?

Express your answer in terms of x in its simplest form.

Answer ..... stalks [2]

(b) If $x = 50$,

(i) how many stalks of sunflowers were sold in total?

Answer ..... stalks [2]

(ii) how many more stalks of sunflowers were sold on Sunday than on Saturday?

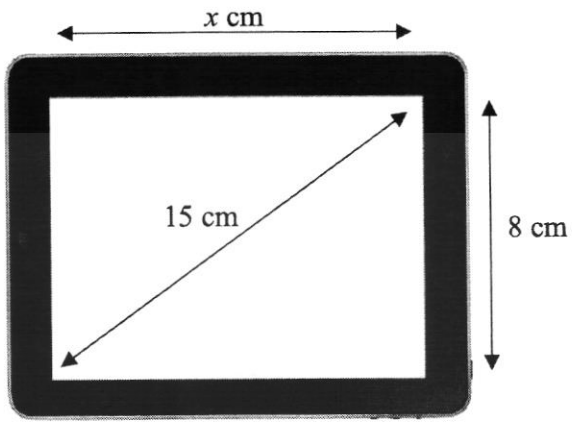
Answer ..... stalks [2]

8 A tablet has a screen size of diagonal 15 cm as shown.

Its length is x cm and its width is 8 cm.

Find the value of x.

Correct your answer to the nearest centimetres.



Answer ..... cm [2]

---

9 7 litres of petrol cost \$14.70.

Calculate

(a) the cost of 15 litres of petrol,

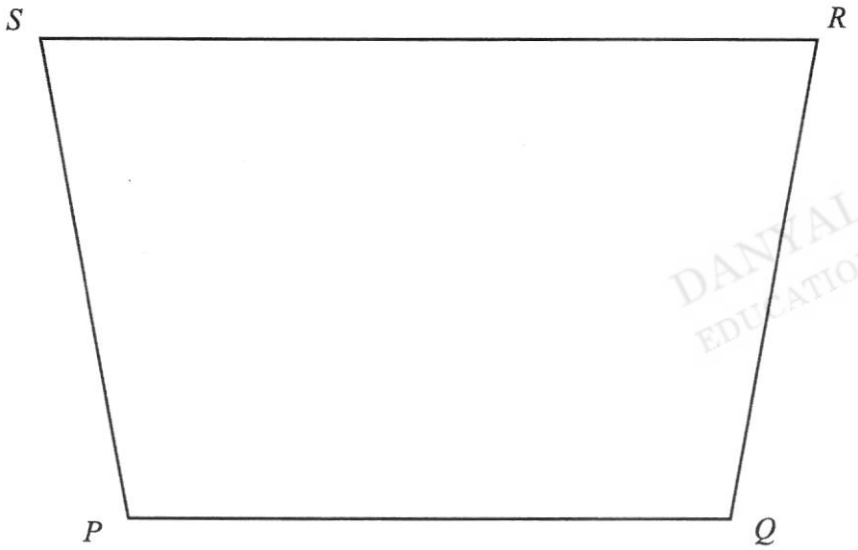
Answer \$ ..... [2]

(b) the amount of petrol that could be bought with \$105.

Answer ..... litres [2]

---

10 **(a)** On the diagram below, **using a straight edge and compasses only**, construct



(i) the perpendicular bisector of the side PQ, [2]

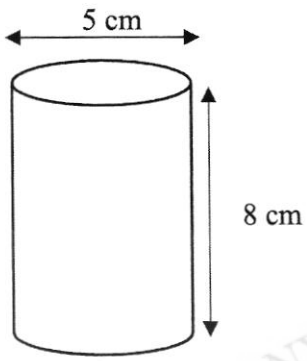
(ii) the bisector of angle PQR. [2]

(b) The two bisectors in **part (a)** meet at point X.

Measure and write down the distance SX.

Answer $SX =$ ..... cm [1]

11 A canned drink can be modelled as a cylinder of diameter of 5 cm and height of 8 cm.
[Take $\pi = 3.142$]
[Volume of cylinder = $\pi r^2 h$]



(a) Write down the radius of the cylinder.

Answer ..... cm [1]

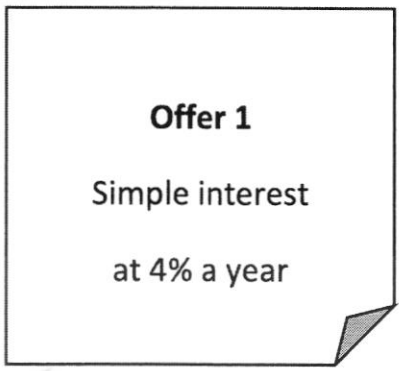
(b) Find the volume of the cylinder.

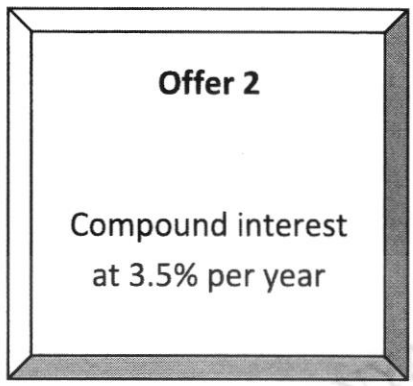
Answer ..... cm^3 [2]

(c) The canned drink has a wrapper around its curved surface area.
Find the area of the wrapper.

Answer ..... cm^2 [2]

12 In 2017, a Singapore bank offered these 2-year investments.





(a) Mr Govin invested $5000 in Offer 1.

Calculate the interest received at the end of 2 years.

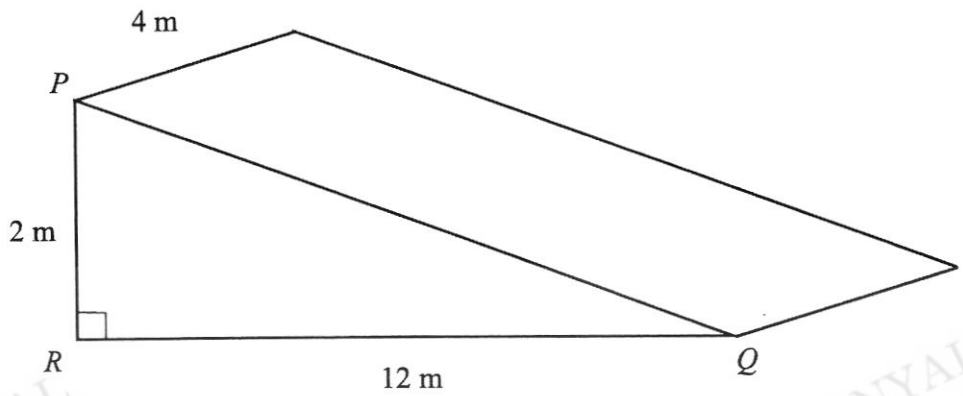
Answer $ ..... [2]

(b) Mrs Tan invested $5000 in Offer 2.

At the end of 2 years, who received more interest and by how much?

Answer ..... by $ ..... [3]

13 The diagram represents the trolley ramp at a warehouse.



(a) Calculate

(i) the length PQ of the ramp, correct to 2 decimal places,

Answer ..... m [2]

(ii) the area of ΔPQR.

Answer ..... m^2 [1]

(b) The ramp is a prism made of concrete.

Calculate the volume of the concrete.

Answer ..... m^3 [2]

(c) The ramp needs to be painted with a layer of paint.

Calculate the surface area to be painted.

Answer ..... m^2 [2]

END OF PAPER

Class	Index Number	Candidate Name

ANG MO KIO SECONDARY SCHOOL
FINAL EXAMINATION 2018
SECONDARY TWO NORMAL TECHNICAL

MATHEMATICS SYLLABUS T **4046/02**

Paper 2

Thursday **1 hour 30 minutes**

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Mathematical Formulae

Compound interest

$$\text{Total amount} = P\left(1+\frac{r}{100}\right)^n$$

Quadratic equation $ax^2+bx+c=0$

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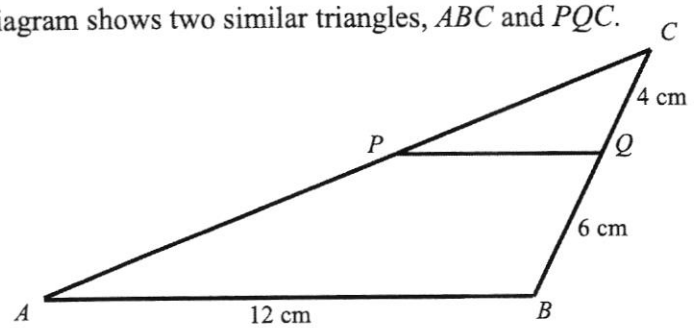
1 **(a)** The diagram shows two similar triangles, ABC and PQC.



Calculate the length of the line PQ.

Answer $PQ =$ ..... cm [2]

(b) 2 litres of milk cost \$6. How much will 4.2 litres of milk cost?

Answer \$ ..... [2]

2 By rounding each number to 2 significant figures, estimate the value of

$$\frac{9.95+5.04}{24.06-9.01}.$$

Show your working.

Answer ..... [2]

---

3 Robert is training for the Singapore Marathon.

As part of his training he runs the 4.8 km trail at MacRitchie Reservoir. He started at 07 42 and finished at 08 12.

(a) How long did it take for Robert to complete his run?

Answer ..... mins [2]

(b) Find his average speed throughout the entire journey.

Answer ..... km/h [2]

---

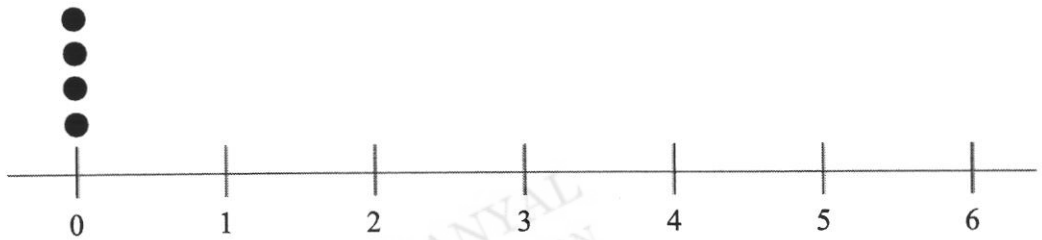
4 The data shows the number of seeds in 20 oranges.

4	5	1	0	4	6	0	0	2	6
1	4	6	2	3	6	6	0	3	1

(a) Complete the frequency table. [2]

Number of seeds	0	1	2	3	4	5	6
Number of oranges (Frequency)	4			2			5

(b) Complete the dot diagram. [2]



(c) Write down the mode.

Answer ..... [1]

(d) Calculate the mean.

Answer ..... [2]

5 A box contains y pieces of chocolate. Christine has 4 boxes of chocolate. Desmond gives her $(y + 5)$ more pieces of chocolate.

(a) How many chocolates does Christine have now? Give your answer in terms of y.

Answer ..... [2]

(b) If $y = 5$, how many chocolates does Christine have?

Answer ..... [2]

---

6 Express 0.048 as

(a) a fraction in its lowest term,

Answer ..... [1]

(b) a percentage.

Answer ..... % [2]

7 **(a)** Simplify $1.3x - 7 + 2.7x + 4$.

Answer ..... [2]

(b) Subtract $a - 2b$ from $3b - 2a$.

Answer ..... [2]

(c) Solve $3c - 6 = c + 8$.

Answer $c =$ ..... [2]

8 At the Suntec IT show in August 2017, a Sony 40 inches Television was sold for $899 The usual price is $1099.

Calculate, giving your answer correct to 2 decimal places,

(a) the percentage discount,

Answer ..... % [2]

(b) the amount of GST to pay if the sales price of $899 is **not** inclusive of GST.

Answer $ ..... [2]

9 Given that the exchange rate between Singapore dollars (SGD) and China Reminbi (RMB) is 1 SGD to 4.85 RMB. For a holiday tour to China, I have decided to bring along $3500.

(a) How much RMB will I receive in exchange for $3500?

Answer ..... RMB [2]

(b) If I am left with 5000 RMB at the end of the tour, how much Singapore Dollars will I get in return? [Use 1 SGD to 4.6 RMB]

Answer ..... SGD [2]

10 There are 5 blue marbles, 7 red marbles and 9 yellow marbles in a bag. If one marble is picked at random from the bag, find the probability that it is

(a) blue,

Answer ..... [1]

(b) black,

Answer ..... [1]

(c) blue or red.

Answer ..... [2]

11 A ribbon of length 50 cm is cut into three pieces. The lengths of the pieces are in the ratio 2 : 5 : 3. Calculate

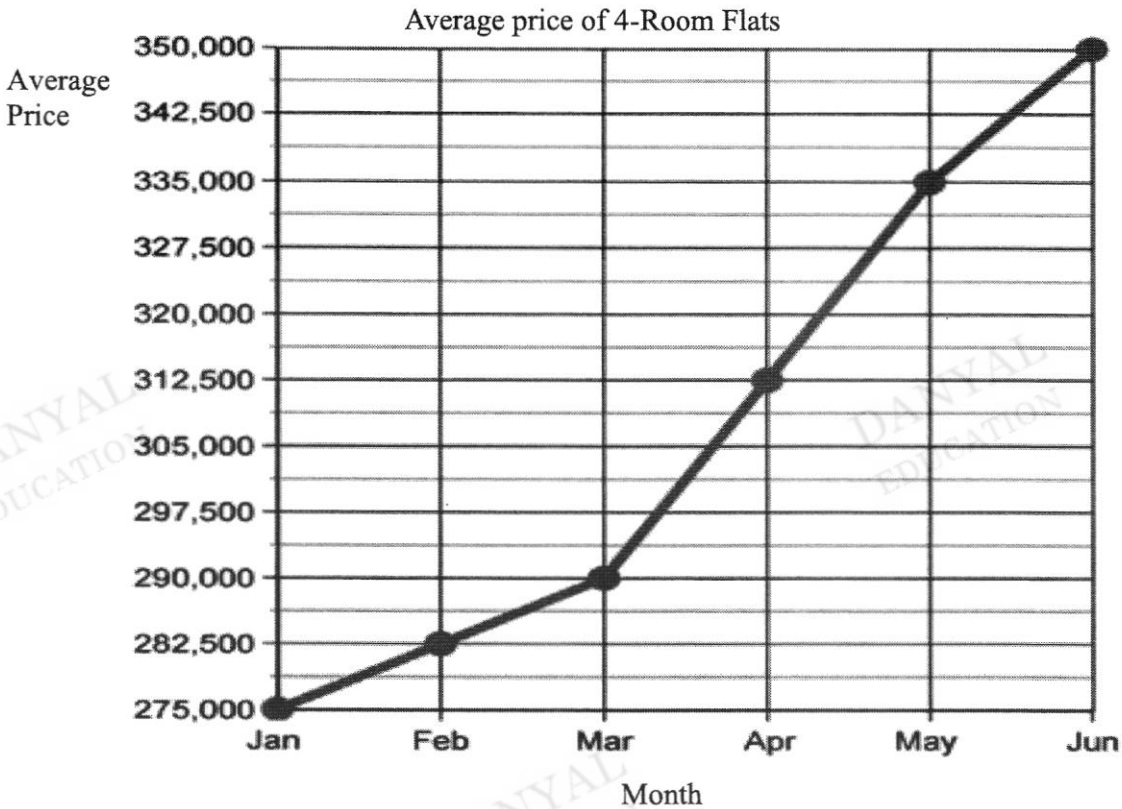
(a) the length of the shortest piece,

Answer ..... cm [2]

(b) the difference in length between the longest and the shortest piece.

Answer ..... cm [2]

12 The graph shows the average price of 4-room flats in the first 6 months of the year 2017.



(a) Using the graph to estimate

(i) the average price of 4-room flats in April,

Answer ..... [1]

(ii) the increase in price between May and June,

Answer ..... [1]

(iii) the percentage increase in price between March and May.

Answer ..... [2]

(b) Which month is the best month to buy a 4-room flat? Give a reason for your answer.

..... [2]

END OF PAPER

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ANG MO KIO SECONDARY SCHOOL
FINAL EXAMINATION 2018
SECONDARY TWO NORMAL TECHNICAL

MATHEMATICS SYLLABUS T **4046/01**
Paper 1

Setter: Mdm Ng Kae Pheng

Wednesday **10 October 2018** **1 hour 30 minutes**

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Geometry and Measurement

Curve surface area of a cone = πrl

Surface area of a sphere = $4\pi r^2$

Volume of a cone = $\frac{1}{3}\pi r^2 h$

Volume of a pyramid= $\frac{1}{3}\times$ base area $\times$ height

Volume of a sphere = $\frac{4}{3}\pi r^3$

1 Express 987.5049

(a) 3 decimal places,

Answer 987.505 [B1] [1]

(b) 3 significant figures.

Answer 988 [B1] [1]

---

2 **(a)** Express the following ratio in its simplest form.

$$0.18 : 0.3$$

Answer 3 : 5 [B1] [1]

(b) Write in the missing value in the equivalent fraction given below.

$$\frac{28}{160} = \frac{7}{\boxed{40}}$$

B1

[1]

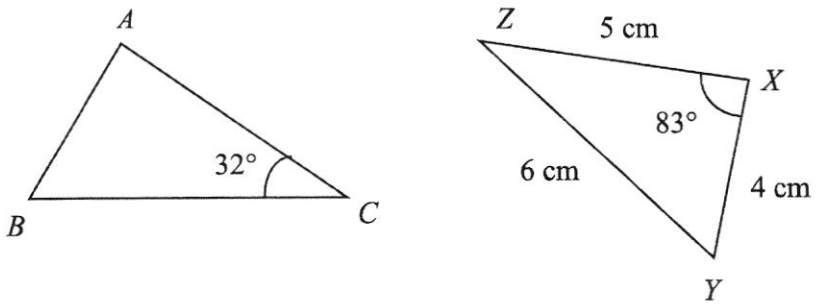
---

3 Convert 100 kilometres per hour into metres per second.

1 hour ----- 100 km
3600s ----- 100 000 m
1s ---------- $\frac{100000}{3600}$ [M1]
$= 27.8$ m/s

Answer 27.8 [A1] m/s [2]

4 Triangle ABC is congruent to triangle XYZ.



(a) Find the length of BC.

Answer 6 [B1] cm [1]

(b) Find angle ZYX.

$180° - 32° - 83° = 65°$ (angle sum of triangle) [M1]

Answer 65 [A1] ° [2]

---

5 10 workers take 12 days to paint a block of flats.

If all workers paint at the same rate, how long would 8 workers take to paint the same block of flats?

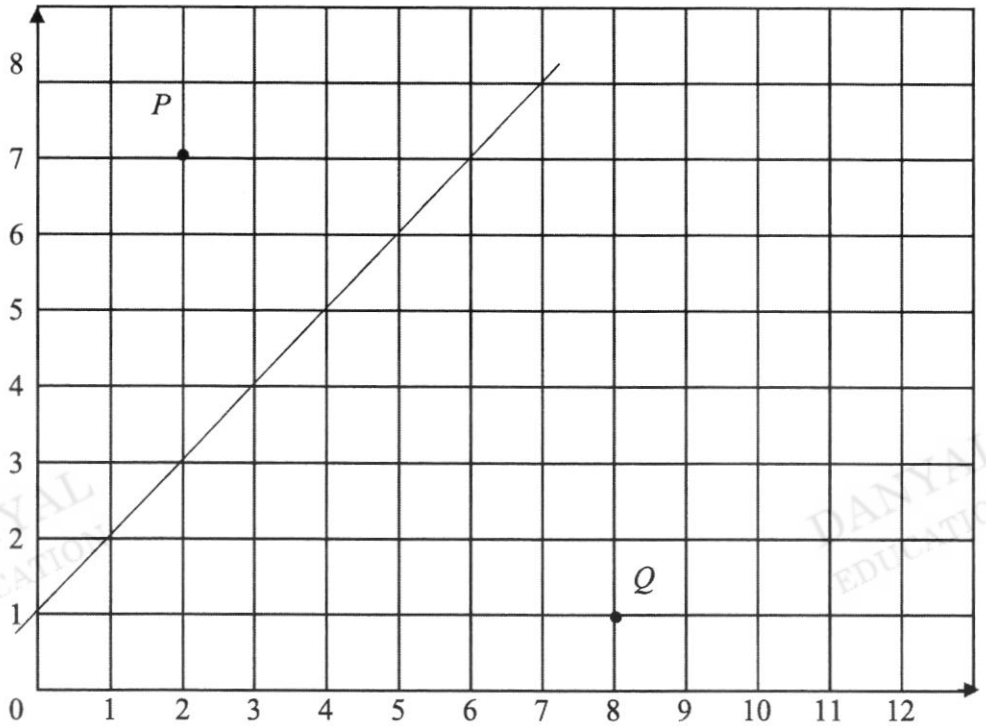
10 workers ----- 12 days

1 worker ------- 120 days

8 workers ------ $\frac{120}{8} = 15$ days [M1]

Answer 15 [A1] days [2]

6



(a) Write down the coordinates of point P.

Answer (2 , 7) B1 [1]

(b) Q is the point (8 , 1).

Label the point on the grid above. [1]

(c) Complete the table of values for $y = x + 1$.

x	0	1	2	3	4
y	1	2	3	4	5

[B1]

[1]

(d) **(i)** Draw the graph of $y = x + 1$ on the grid above. [B1] [1]

(ii) Find the value of x when $y = 6$.

Answer $x =$ 5 [B1] [1]

7 The table below shows the number of stalks of sunflowers sold at a florist last week.

Day	No. of stalks of sunflowers sold
Monday to Friday	$2x$ per day
Saturday	$x + 40$
Sunday	$3x - 5$

(a) What was the total number of stalks of sunflowers sold last week?

Express your answer in terms of x in its simplest form.

$2x+2x+2x+2x+2x+x+40+3x-5$ [M1]
$=10x+x+40+3x-5$
$=14x+35$

Answer $14x+35$ [B1] stalks [2]

(b) If $x=50$,

(i) how many stalks of sunflowers were sold in total?

$14(50)+35$ [M1]

Answer 735 [A1] stalks [2]

(ii) how many more stalks of sunflowers were sold on Sunday than on Saturday?

Sat : 90
Sun : 145

$145 - 90 = 55$ [M1]

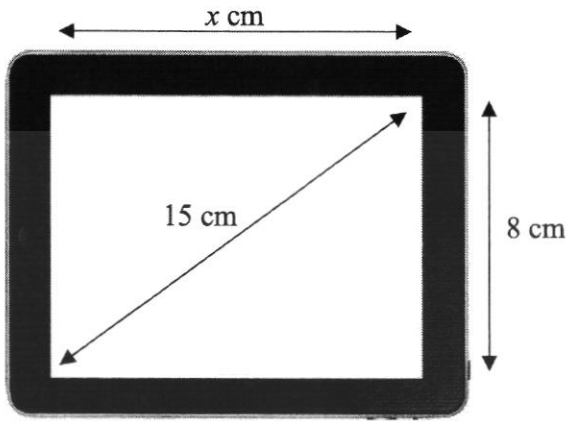
Answer 55 [A1] stalks [2]

8 A tablet has a screen size of diagonal 15 cm as shown.

Its length is x cm and its width is 8 cm.

Find the value of x.

Correct your answer to the nearest centimetres.



$x^2 + 8^2 = 15^2$ M1

$x^2 = 15^2 - 8^2$

$x = \sqrt{161}$

$x = 12.6885$

$x = 13$ (nearest centimetres)

Answer 13 [A1] cm [2]

---

9 7 litres of petrol cost \$14.70.

Calculate

(a) the cost of 15 litres of petrol,

7 litres ----- \$14.70

1 litre ------ $\frac{14.7}{7}$ [M1]

15 litre ------ $\frac{14.7}{7} \times 15 = \$31.50$

Answer \$ 31.50 [A1] [2]

(b) the amount of petrol that could be bought with \$105.

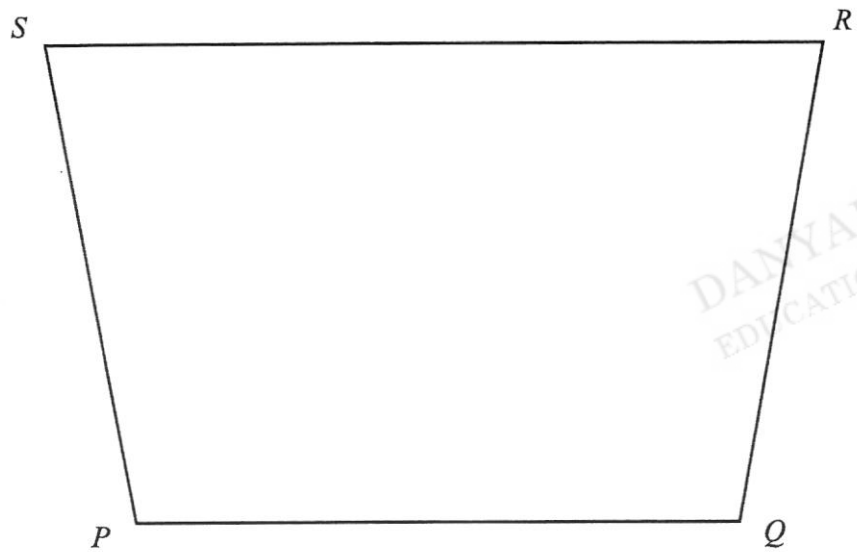
\$14.70 ----- 7 litres

\$105 ------ $\frac{7}{14.7} \times 105 = 50$ [M1]

Answer 50 [A1] litres [2]

---

10 **(a)** On the diagram below, **using a straight edge and compasses only**, construct



(i) the perpendicular bisector of the side PQ, [B2] [2]

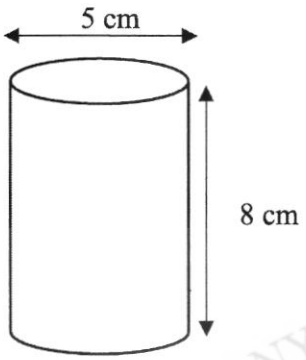
(ii) the bisector of angle PQR. [B2] [2]

(b) The two bisectors in **part (a)** meet at point X.

Measure and write down the distance SX.

Answer $SX =$ 5.7 ±0.2 [B1] cm [1]

11 A canned drink can be modelled as a cylinder of diameter of 5 cm and height of 8 cm.
[Take $\pi = 3.142$]
[Volume of cylinder = $\pi r^2 h$]



(a) Write down the radius of the cylinder.

Answer 2.5 [B1] cm [1]

(b) Find the volume of the cylinder.

Volume
$= 3.142 \times 2.5^2 \times 8$ [M1]
$= 157.1$

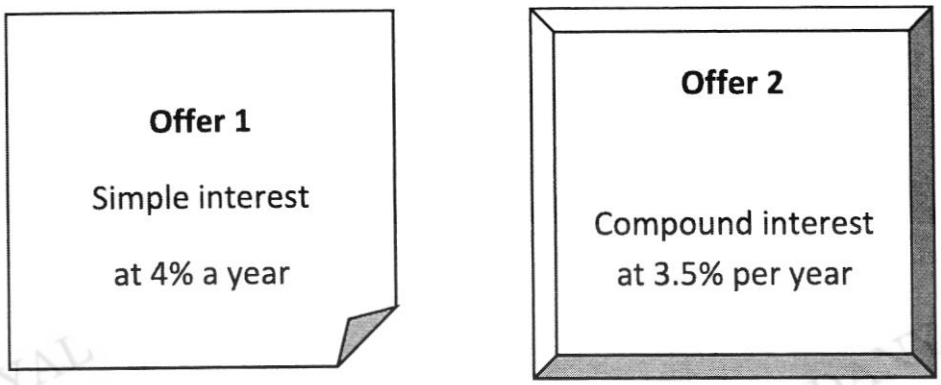
Answer 157.1 [A1] cm^3 [2]

(c) The canned drink has a wrapper around its curved surface area.
Find the area of the wrapper.

Area = $2 \times 3.142 \times 2.5 \times 8$ [M1]
= 125.68

Answer 125.68 [A1] cm^2 [2]

12 In 2017, a Singapore bank offered these 2-year investments.



(a) Mr Govin invested $5000 in Offer 1.

Calculate the interest received at the end of 2 years.

$\frac{4}{100} \times 5000 \times 2 = 400$ [M1]

Answer $ 400 [A1] [2]

(b) Mrs Tan invested $5000 in Offer 2.

At the end of 2 years, who received more interest and by how much?

1st year:

$\frac{3.5}{100} \times 5000 = \$175$

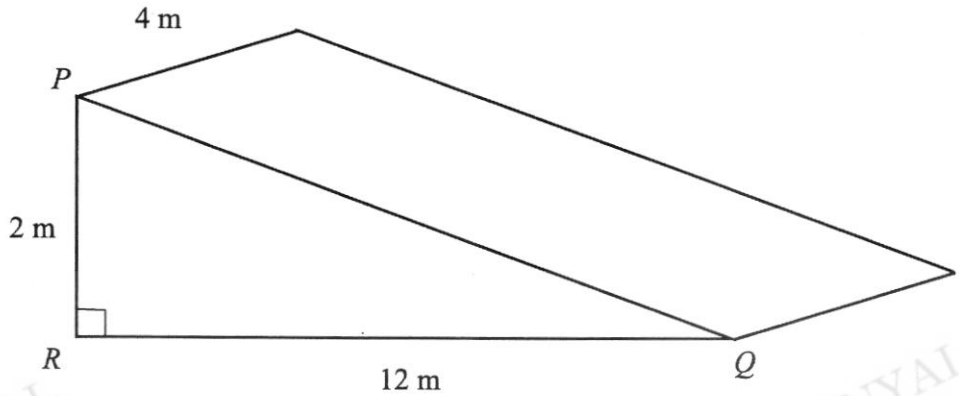
2nd year:

$\frac{3.5}{100} \times 5175 = \$181.13$ [M1]

$181.13 + 175 = \$356.13$

Answer Mr Govin received more [A1] by $ 43.87 [A1] [3]

13 The diagram represents the trolley ramp at a warehouse.



(a) Calculate

(i) the length PQ of the ramp, correct to 2 decimal places,

$PQ^2 = 2^2 + 12^2$ [M1]

$PQ = \sqrt{148}$

Answer 12.2 [A1] cm [2]

(ii) the area of ΔPQR.

$\frac{1}{2} \times 2 \times 12$

Answer 12 [A1] cm^2 [1]

(b) The ramp is a prism made of concrete.

Calculate the volume of the concrete.

Volume = 12 x 4 [M1]

Answer 48 [A1] cm^3 [2]

(c) The ramp needs to be painted with a layer of paint.

Calculate the surface area to be painted.

$\frac{1}{2} \times 12 \times 2 \times 2 + 4 \times 12.2 + 2 \times 4$ [M1]

$= 80.8$

Answer 80.8 [A1] cm^2 [2]

END OF PAPER

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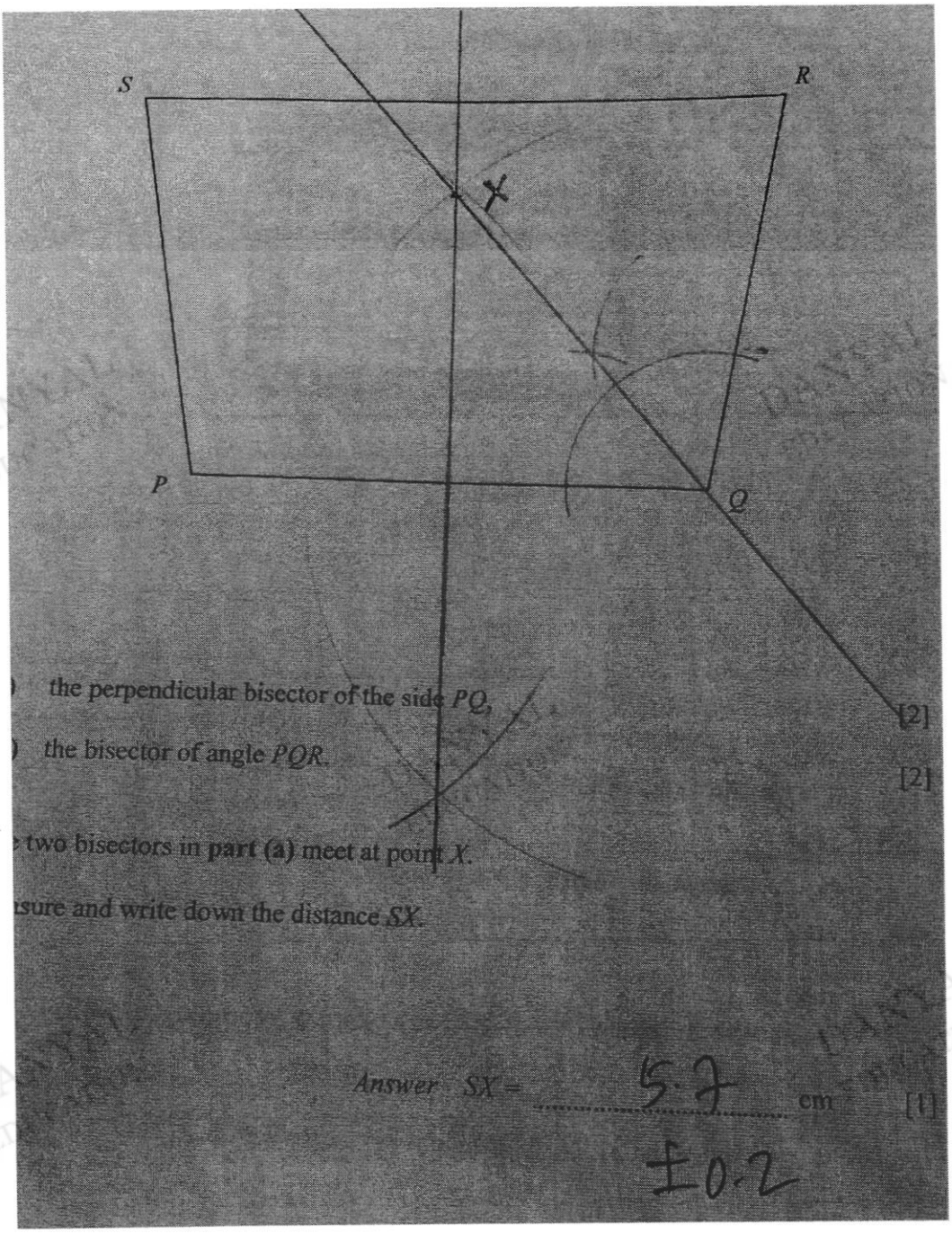

) the perpendicular bisector of the side PQ, [2]

) the bisector of angle PQR. [2]

e two bisectors in **part (a)** meet at point X.

asure and write down the distance SX.

Answer $SX =$ 5.7 cm [1]

±0.2

AMKSS 2NT EM P2 FE 2018 Answer Scheme

<table>
<tr><th>Qn</th><th>Answers</th><th>Marking Scheme</th></tr>
<tr><td>1(a)</td><td>$\frac{PQ}{AB} = \frac{4}{4+6}$
$\frac{PQ}{12} = \frac{4}{10}$
$PQ = \frac{4}{10} \times 12$
$= 4.8$ cm</td><td>M1

A1</td></tr>
<tr><td>1(b)</td><td>$2litres$ – – – –\$6
$1litre$ – – – –\$3
$4.2litres$ – – – $\$3 \times 4.2 = \$12.60$</td><td>M1

A1</td></tr>
<tr><td>2</td><td>$\frac{10+5}{24-9}$
$= \frac{15}{15} = 1$</td><td>M1

A1</td></tr>
<tr><td>3(a)</td><td>30 mins</td><td>B1</td></tr>
<tr><td>3(b)</td><td>$Average\ speed = \frac{total\ distance}{total\ time}$
$= \frac{4.8\ km}{\frac{30}{60}\ h}$
$= 9.6\ km/h$</td><td>M1

A1</td></tr>
<tr><td>4(a)</td><td><table><tr><td>seeds</td><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td>F</td><td>4</td><td>3</td><td>2</td><td>2</td><td>3</td><td>2</td><td>4</td></tr></table></td><td>B2</td></tr>
<tr><td>4(b)</td><td>Correct dot diagram</td><td>B2</td></tr>
<tr><td>4(c)</td><td>0 and 6</td><td>B1</td></tr>
</table>

4(d)	$\frac{59}{20}$ $=2.95$	M1 A1
5(a)	$4\times y+(y+5)$ $=5y+5$	B1
5(b)	30	B2
6(a)	$\frac{48}{1000}=\frac{6}{125}$	B1
6(b)	0.048×100 4.8%	M1 A1
7(a)	$1.3x+2.7x-7+4$ $4x-3$	M1 A1
7(b)	$3b-2a-(a-2b)$ $=3b-2a-a+2b$ $=5b-3a$	M1 A1
7(c)	$3c-6=c+8$ $3c-c=6+8$ $2c=14$ $c=7$	M1 A1
8(a)	$\frac{200}{1099}\times100$ $=18.2\%$	M1 A1
8(b)	$\frac{899}{107}\times7$ $=\$58.81$	M1 A1
9(a)	3500×4.85 $=16975$ RMB	M1 A1
9(b)	$\frac{5000}{4.6}$ $=\$1086.96$	M1 A1

12(a)(i)	\$312500	B1
12(a)(ii)	\$15000	B1
12(a)(iii)	$\frac{45000}{290000}\times 100$ $=15.5\%$	M1 A1
12(b)	Jan. It is because the price of 4 room flat is lowest compared to the other months.	B1,B1
10(a)	$\frac{5}{21}$	B1
10(b)	0	B1
10(c)	$\frac{5+7}{21}$ $=\frac{4}{7}$	M1 A1
11(a)	Total parts= 10 1 part =5cm 2 parts =10cm	M1 A1
11(b)	5 parts = 25cm $25-10=15cm$	M1 A1