

NAME:

CLASS:

INDEX NO:



QUEENSWAY SECONDARY SCHOOL
MID-YEAR EXAMINATION 2018
SECONDARY 2 NORMAL TECHNICAL

Parent's Signature:

MATHEMATICS

Paper 1

4046/01

8 May 2018

1 hour

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 HB pencil for any diagrams or graphs.

Do not use staples, paper clips, glue or correction fluid.

Answer **all** the 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 3 significant figures. Give answers in degrees to 1 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 number of marks for this paper is 40.

This document consists of 8 printed pages.

Setter: Mr Tan Tuan Heng

[Turn over

1. Round off the following to the decimal/significant figures indicated in the brackets.

(a) 0.22458 (3 decimal places)

Answer: _____ [1]

(b) 0.02675 (3 significant figures)

Answer: _____ [1]

2. Estimate $39.8 \div 4.03$ without using your calculator.

Answer: _____ [2]

3. Sue cycled 60 km from 7 pm to 10 pm. Find her average speed in kilometres per hour.

Answer: _____ km/h [2]

4. Without using the calculator, evaluate $\frac{2}{5} \div (\frac{1}{4} - \frac{1}{5})$. Show your working clearly.

Answer: _____ [3]

5. (a) Express $20\frac{3}{4}\%$ as a fraction in its simplest form.

Answer: _____ [1]

- (b) Evaluate 85% of 20 cm.

Answer: _____ [1]

6. Express the following ratios in its simplest form.

(a) $\frac{2}{3} \text{ ml} : \frac{1}{4} \text{ ml}$

Answer: _____ [1]

(b) $\frac{3}{4} \text{ h} : 40 \text{ min}$

Answer: _____ [2]

7. Simplify $5x + 2(3x - 1)$.

Answer: $x =$ _____ [2]

8. Solve the following equations.

(a) $5x + 12 = 7$

Answer: $x =$ _____ [2]

(b) $5k = 42 - 2k$

Answer: $k =$ _____ [2]

9. Joe can fold 75 stars using straws in 3 hours.

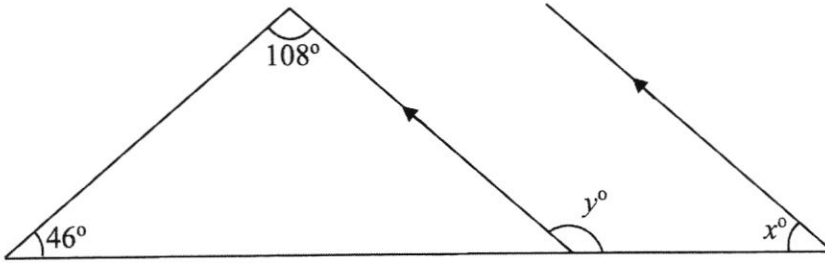
(a) How many stars can Joe fold in 1 hour?

(b) How much time would Joe need if he wants to fold 800 stars?

Answer: (a) _____ stars [2]

(b) _____ hrs [2]

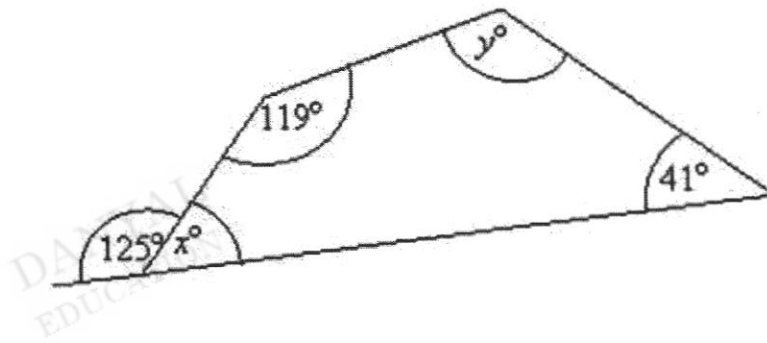
10. Find the values of x and y in the figure below. State your reasons clearly.



Answer: $x =$ _____ [2]

$y =$ _____ [2]

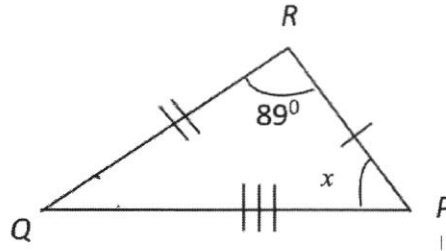
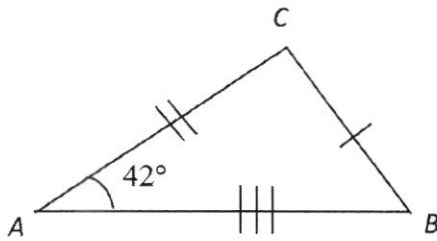
11. Find the values of the unknown angles in the following diagram. State your reasons clearly.



Answer: $x =$ _____ [2]

$y =$ _____ [2]

12.



In the diagram, $AB = QP$, $BC = PR$.

(a) Fill in the blanks below.

(i) $CA =$ _____

[1]

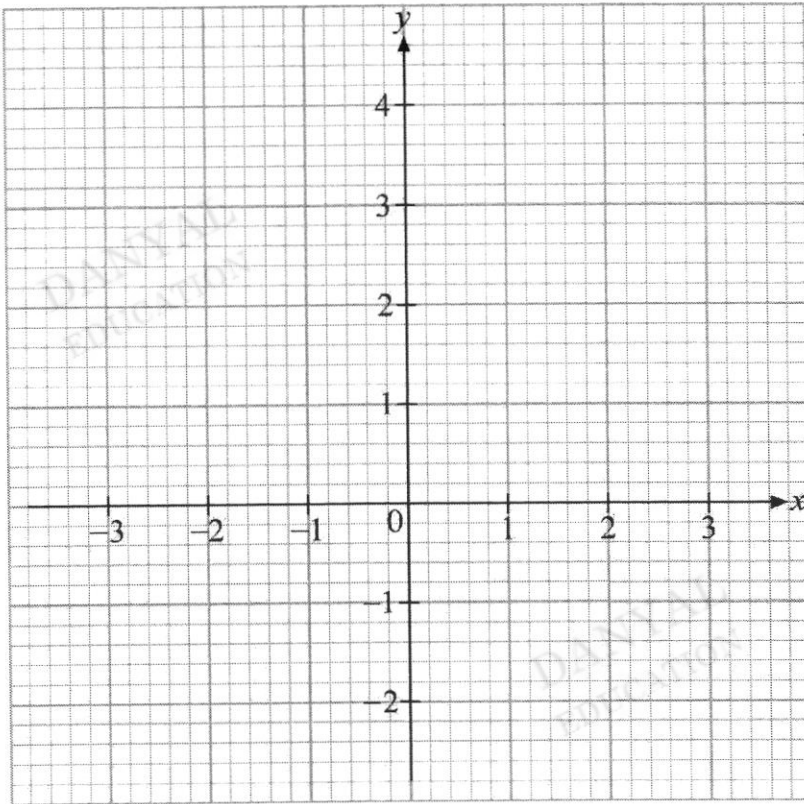
(ii) $\triangle ABC \equiv \triangle$ _____

[1]

(b) Find the value of x .

(b) Answer: $x =$ _____ [2]

13. On the grid below,
- (a) mark and label point $A(0, -2)$ [1]
 - (b) mark and label point $B(2, 0)$ [1]
 - (c) draw and label the line $x = -2$. [1]
 - (d) draw and label the line $y = 1$. [1]



End of paper

NAME:	CLASS:	INDEX NO:
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QUEENSWAY SECONDARY SCHOOL
MID-YEAR EXAMINATION 2018
SECONDARY 2 NORMAL TECHNICAL

Parent's Signature:

MATHEMATICS

Paper 2

4046/02

11 May 2018

1 hour 15 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 HB pencil for any diagrams or graphs.

Do not use staples, paper clips, highlighters, glue or correction fluid.

Answer **all** the questions.

The number of marks is given in brackets [] at the end of each question or part question.

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 total number of marks for this paper is 50.

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 3 significant figures. Give answers in degrees to one decimal place.

For π , use either your calculator value or 3.142.

Section A (28 marks)

1. Convert the following.

(a) $2l$ to ml .

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

(b) 36 km/h to m/s

Answer (b)..... [2]

2. Simplify the following algebraic expressions.

(a) $3(2m - 3n) + 9n$

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

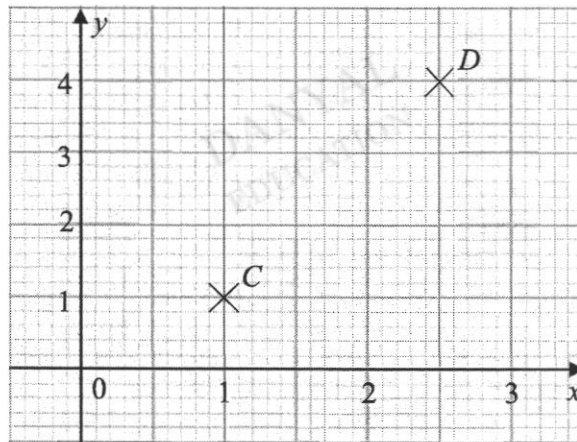
(b) $\frac{3x+2}{5} - \frac{5x}{4}$

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Answer (b)..... [3]

3. Write down the coordinates of *C* and *D*.



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Answer *C* =, *D* = [2]

4. Solve the following equations.

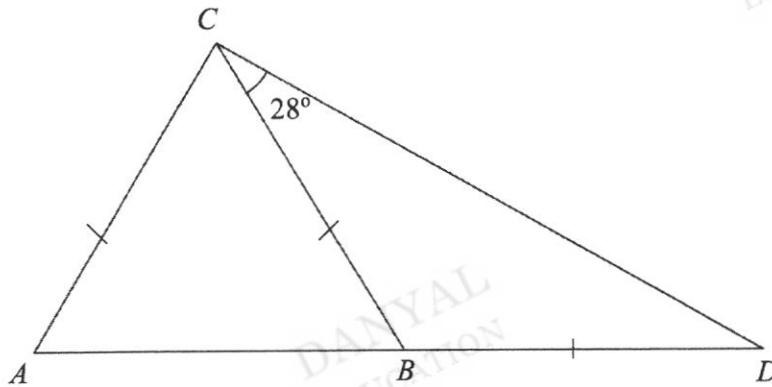
(a) $13x - 2 = 22 + x$

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

(b) $7y - 12 = 2(4y - 8)$

Answer (b)..... [3]

5. $\triangle ABC$ and $\triangle DCB$ are isosceles triangles where $AC = BC = BD$ and $\angle BCD = 28^\circ$.



Find

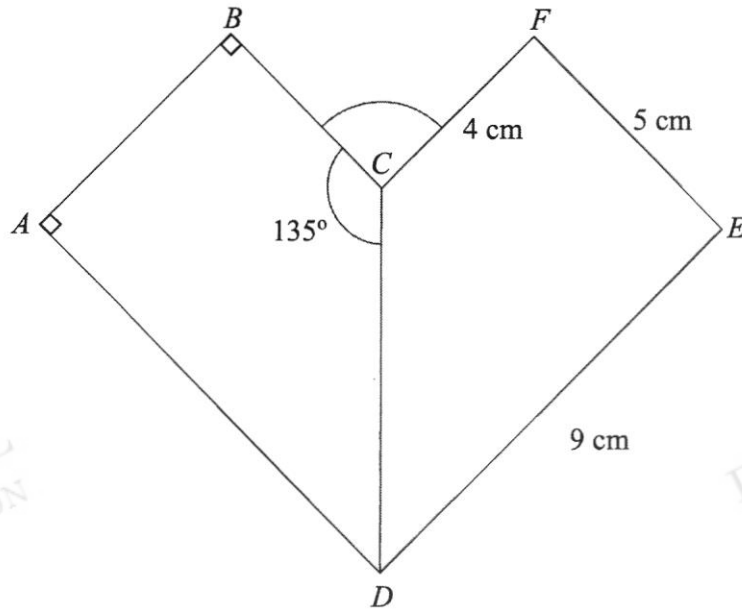
(a) $\angle CBD$

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

(b) $\angle CAB$

Answer (b)..... [2]

6. Trapezium $ABCD$ is congruent to trapezium $EFCD$.



- (a) State the length of AD and AB .

Answer (a) $AD = \dots\dots\dots$, $AB = \dots\dots\dots$ [2]

- (b) Calculate $\angle BCF$.

Answer (b)..... [3]

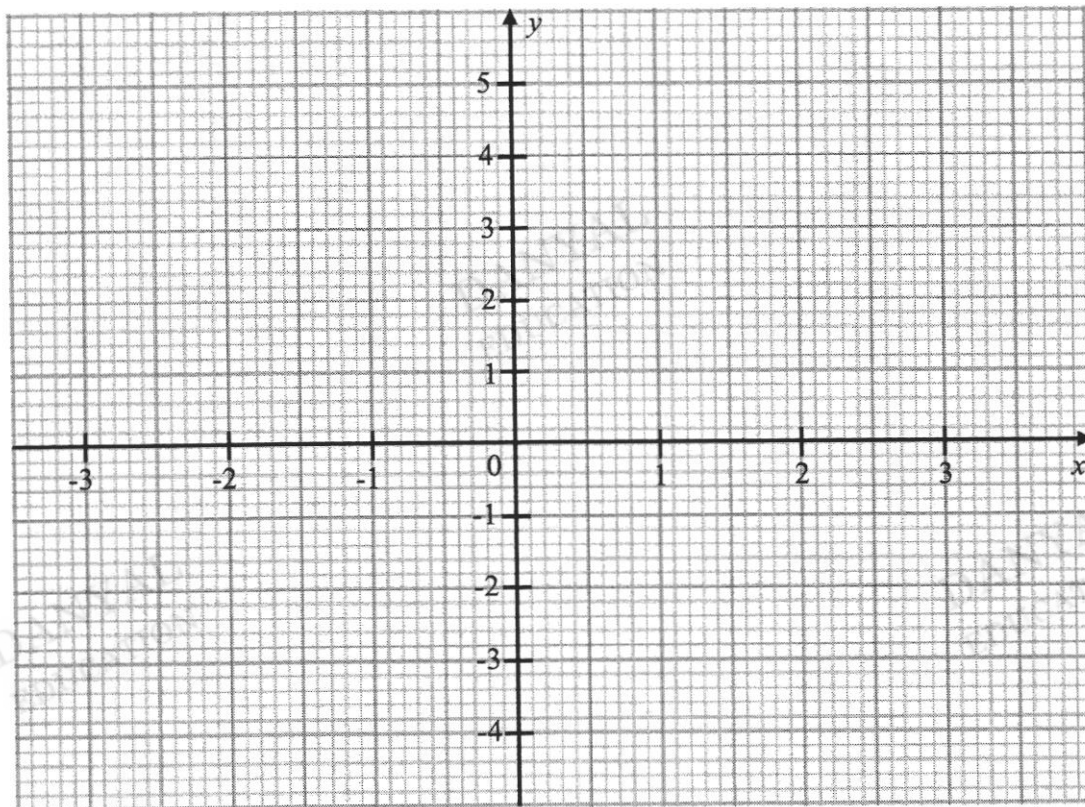
7. The table below shows the corresponding x and y values for the equation $y = 3x + 2$.

x	-2	-1	b	1
y	a	-1	2	5

- (a) Find the values of a and b .

Answer (b) $a = \dots\dots\dots$, $b = \dots\dots\dots$ [2]

- (b) Draw the graph of $y = 3x + 2$ on the grid provided below. [2]

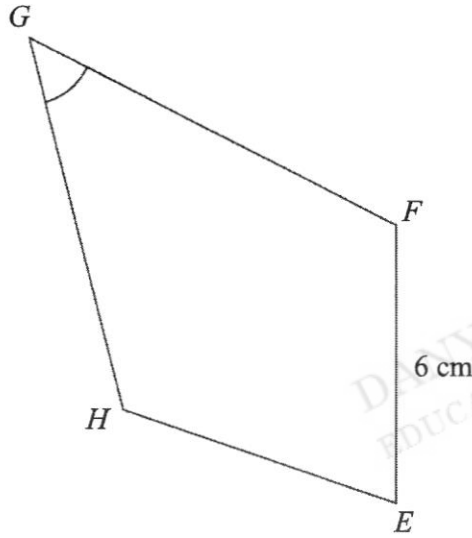
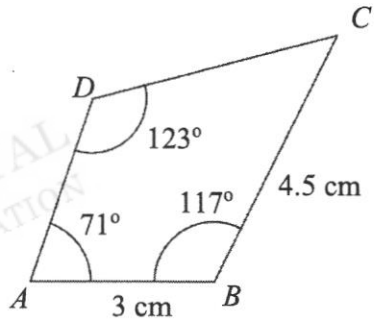


- (c) From graph, write down the coordinates of the point where the line cuts the y -axis.

Answer (c)..... [1]

Section B (22 marks)

8. Quadrilateral $ABCD$ is similar to $EFGH$.



(a) State $\angle HEF$.

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

(b) Calculate the length of GF .

Answer (b)..... [2]

(c) Find the unknown angle $\angle FGH$.

Answer (c)..... [2]

9. Mary is travelling to Malaysia and Marcus is travelling to Japan. The table below shows the currency conversion rates for both Malaysia and Japan.

Exchange Rates
Singapore SGD\$100 = Malaysia Ringgit MYR\$298
Singapore SGD\$100 = Japan Yen JPY\$813

- (a) Albert wishes to convert SGD\$1000 into JPY\$ for his trip. Calculate the amount of JPY\$ he would have.

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

- (b) Mary brought MYR\$5000 for her trip.

Calculate the amount of SGD\$ that she converted, giving your answer to 2 decimal place.

Answer (b)..... [2]

10. Jason cycles from his house for 10 minutes before stopping for 45 seconds at a traffic junction. He then cycles for another 14 minutes before reaching school. If the distance between his house and the school is 2090 m, calculate his average speed in m/s. Give your answer to 2 decimal places.

Answer [4]

11. A line with point E is drawn for you in the space below.

(a) Construct $\triangle EFG$ where $EF = 9$ cm, $FG = 10$ cm and $EG = 7$ cm. [3]

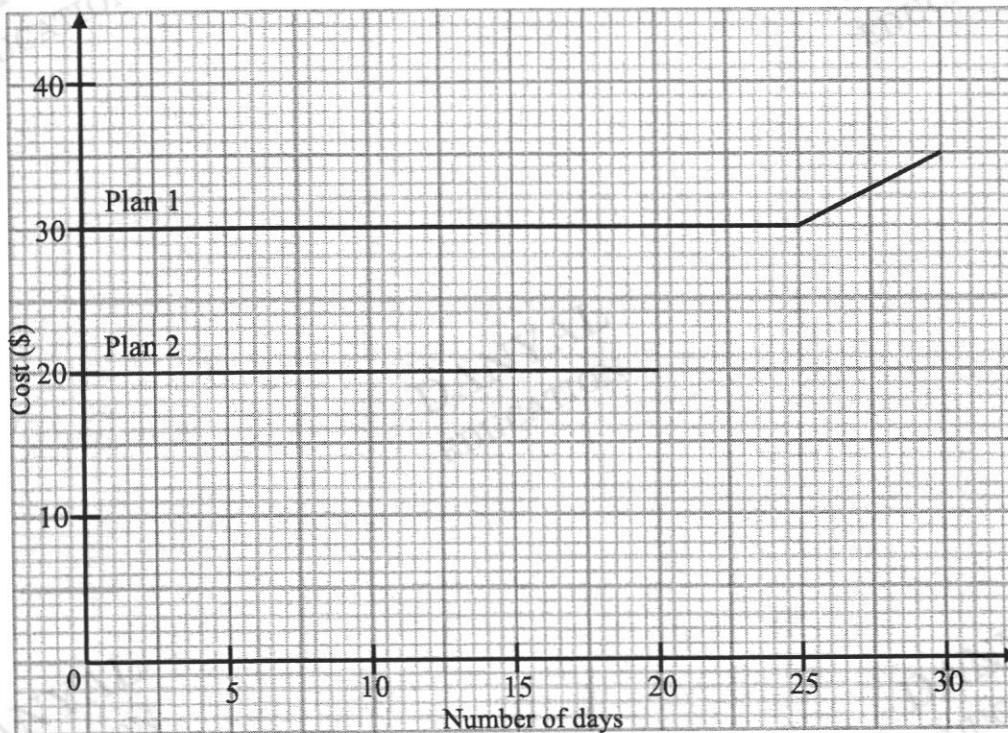
(b) Construct and label q which is the angle bisector of $\angle EFG$. [2]

E

12. A private bicycle park offers its customers two season parking plans.

	Plan 1	Plan 2
Basic monthly payment	\$30	\$20
Number of days with free parking	25	20
Cost for each day above the free parking	\$1	\$2

Below shows the graph of charges for Plan 1 and part of the graph for Plan 2 for a month with 30 days.



(a) Using data from the table, complete the graph for Plan 2. [1]

(b) David wants to park his bicycle for a total of 30 days, which plan should David choose if he wants the cheapest plan? Explain your answer.

.....

[2]

(c) Jacky mentioned that it does not matter if he takes Plan 1 or Plan 2 as he pays the same amount of money. State the number of days that Jacky is parking at the bicycle park.

Answer (c)..... [1]

NAME:	CLASS:	INDEX NO:
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QUEENSWAY SECONDARY SCHOOL
MID-YEAR EXAMINATION 2018
SECONDARY 2 NORMAL TECHNICAL

Parent's Signature:

MATHEMATICS

Paper 1

4046/01

8 May 2018

1 hour

Candidates answer on the Question Paper.

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The total number of marks for this paper is 40.

This document consists of 8 printed pages.

Setter: Mr Tan Tuan Heng

[Turn over

1. Round off the following to the decimal/significant figures indicated in the brackets.

(a) 0.22458 (3 decimal places)

0.225 B1

Answer: _____ [1]

(b) 0.02675 (3 significant figures)

0.0268 B1

Answer: _____ [1]

2. Estimate $39.8 \div 4.03$ without using your calculator.

$\approx 40 \div 4$ M1

$= 10$ A1

Answer: _____ [2]

3. Sue cycled 60 km from 7 pm to 10 pm. Find her average speed in kilometres per hour.

Distance = 60 km

Time = 3 hrs

$Ave.Speed = \frac{60}{3}$ M1

$= 20km/h$ A1

Answer: _____ km/h [2]

4. Without using calculator, evaluate $\frac{2}{5} \div \left(\frac{1}{4} - \frac{1}{5}\right)$. Show your working clearly.

$$= \frac{2}{5} \div \left(\frac{5-4}{20}\right) \quad \text{M1}$$

$$= \frac{2}{5} \div \frac{1}{20}$$

$$= \frac{2}{5} \times 20 \quad \text{M1}$$

$$= 8 \quad \text{A1}$$

Answer: _____ [3]

5. (a) Express $20\frac{3}{4}\%$ as a fraction in its simplest form.

$$= \frac{20\frac{3}{4}}{100}$$

$$= \frac{83}{400} \quad \text{B1}$$

Answer: _____ [1]

(b) Evaluate 85% of 20 cm.

$$= \frac{85}{100} \times 20 \quad \text{B1}$$
$$= 17\text{cm}$$

Answer: _____ [1]

6. Express the following ratios in its simplest form.

(a) $\frac{2}{3} \text{ ml} : \frac{1}{4} \text{ ml}$

8 : 3 B1

Answer: _____ [1]

(b) $\frac{3}{4} \text{ h} : 40 \text{ min}$

$\frac{3}{4} \times 60 : 40$ M1

45 : 40

9 : 8 A1

Answer: _____ [2]

7. Simplify $5x + 2(3x - 1)$.

$= 5x + 6x - 2$ M1

$= 11x - 2$ A1

Answer: _____ [2]

8. Solve the following equations.

(a) $5x + 12 = 7$

$$5x = 7 - 12$$

$$5x = -5 \quad \text{M1}$$

$$x = \frac{-5}{5}$$

$$x = -1 \quad \text{A1}$$

Answer: $x =$ _____ [2]

(b) $5k = 42 - 2k$

$$5k + 2k = 42$$

$$7k = 42 \quad \text{M1}$$

$$k = \frac{42}{7}$$

$$k = 6 \quad \text{A1}$$

Answer: $k =$ _____ [2]

9. Joe can fold 75 stars using straws in 3 hours.

(a) How many stars can Joe fold in 1 hour?

(b) How much time would Joe need if he wants to fold 800 stars?

(a)
75 stars ----- 3 hrs

$$\frac{1}{3} \times 75 \quad \text{M1} \text{-----} 1 \text{ hr}$$

$$= 25 \text{ stars} \quad \text{A1}$$

(b)

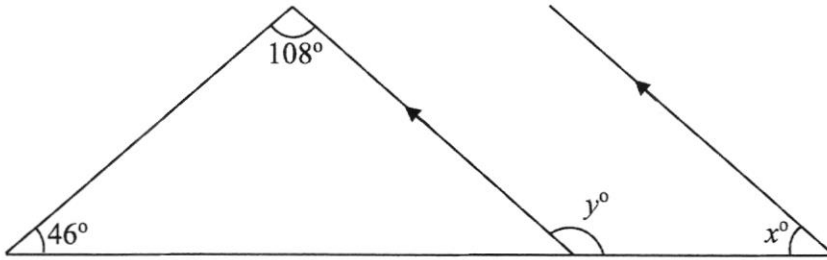
$$\frac{800}{50} \times 2 \quad \text{M1}$$

$$= 32 \text{ hrs} \quad \text{A1}$$

Answer: (a) _____ stars [2]

(b) _____ hrs [2]

10. Find the values of x and y in the figure below. State your reasons clearly.



$$\angle a = 180^\circ - 108^\circ - 46^\circ \quad (\angle \text{ sum of a } \Delta = 180^\circ) \quad \text{M1}$$

$$\angle a = 26^\circ$$

$$x^\circ = 26^\circ \quad (\text{corr. } \angle \text{ s of parallel lines}) \quad \text{A1}$$

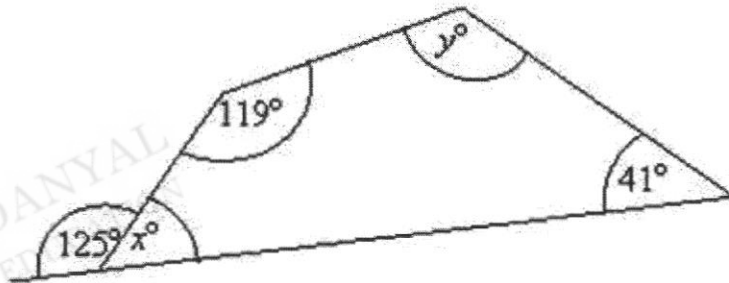
$$\angle y^\circ = 180^\circ - 26^\circ \quad (\text{adj. } \angle \text{ on a str. line}) \quad \text{M1}$$

$$y^\circ = 154^\circ \quad \text{A1}$$

Answer: x _____ [2]

y _____ [2]

11. Find the values of the unknown angles in the following diagram. State your reasons clearly.



$$x^\circ = 180^\circ - 125^\circ \quad (\text{adj. } \angle \text{ on a str. line}) \quad \text{M1}$$

$$x^\circ = 55^\circ \quad \text{A1}$$

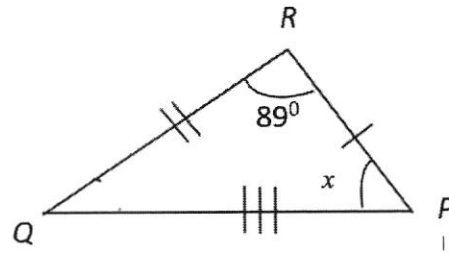
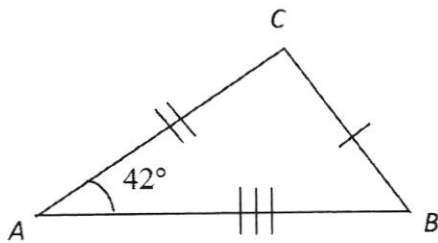
$$y^\circ = 360^\circ - 119^\circ - 41^\circ - 55^\circ \quad (\angle \text{ sum of a quad.} = 360^\circ) \quad \text{M1}$$

$$y^\circ = 145^\circ \quad \text{A1}$$

Answer: x = _____ [2]

y = _____ [2]

12.



In the diagram, $AB = QP$, $BC = PR$.

(a) Fill in the blanks below.

(i) $CA = RQ$

B1

[1]

(ii) $\triangle ABC \equiv \triangle QPR$

B1

[1]

(b) Find the value of x .

$$\angle x = 180^\circ - 89^\circ - 42^\circ \quad (\angle \text{sum of a } \triangle = 180^\circ)$$

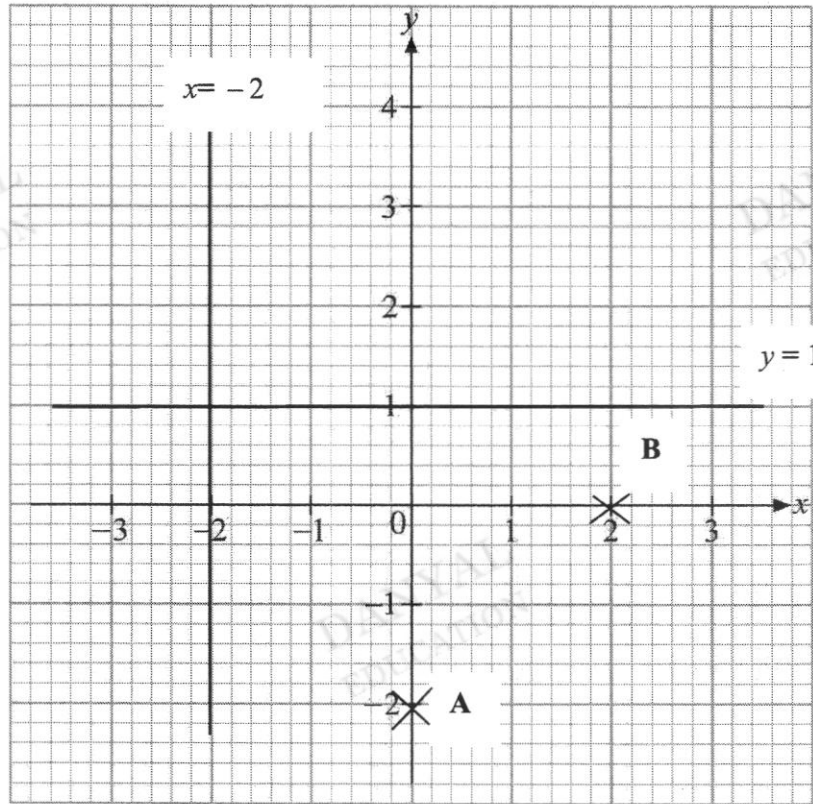
M1

$$\angle x = 49^\circ$$

A1

(b) Answer: $x =$ _____ [2]

13. On the grid below,
- (a) mark and label point $A(0, -2)$ [1]
 - (b) mark and label point $B(2, 0)$ [1]
 - (c) draw and label the line $x = -2$. [1]
 - (d) draw and label the line $y = 1$. [1]



End of paper

NAME:	CLASS:	INDEX NO:
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QUEENSWAY SECONDARY SCHOOL
MID-YEAR EXAMINATION 2018
SECONDARY 2 NORMAL TECHNICAL

Parent's Signature:

Mark Scheme

This document consists of 10 printed pages.

Section A (28 marks)

1. Convert the following.

(a) $2l$ to ml

$$\begin{aligned} 2l &= 2 \times 1000 && \text{[M1]} \\ &= 2000ml && \text{[A1]} \end{aligned}$$

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

(b) 36 km/h to m/s

$$\begin{aligned} 36\text{km/h} &= 36000\text{m}/60\text{mins} \\ &= 36000\text{m}/3600\text{s} && \text{[M1]} \\ &= 10\text{m/s} && \text{[A1]} \end{aligned}$$

Answer (b)..... [2]

2. Simplify the following algebraic expressions.

(a) $3(2m - 3n) + 9n$

$$\begin{aligned} 3(2m - 3n) + 9n &= 6m - 9n + 9n && \text{[M1]} \\ &= 6m && \text{[A1]} \end{aligned}$$

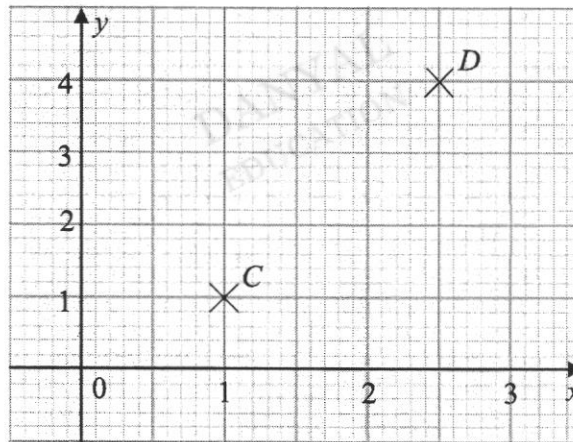
Answer (a)..... [2]

(b) $\frac{3x+2}{5} - \frac{5x}{4}$

$$\begin{aligned} \frac{3x+2}{5} - \frac{5x}{4} &= \frac{4(3x+2)}{4(5)} - \frac{5(5x)}{5(4)} && \text{[M1]} \\ &= \frac{12x+8}{20} - \frac{(25x)}{20} \\ &= \frac{8+12x-25x}{20} && \text{[M1]} \\ &= \frac{8-13x}{20} && \text{[A1]} \end{aligned}$$

Answer (b)..... [3]

3. Write down the coordinates of C and D.



Answer C = (1, 1) [B1] , D = (2.5, 4) [B1] [2]

4. Solve the following equations.

(a) $13x - 2 = 22 + x$

$$\begin{aligned} 13x - 2 &= 22 + x \\ 13x - x &= 22 + 2 && \text{[M1]} \\ 12x &= 24 \\ x &= 2 && \text{[A1]} \end{aligned}$$

Answer (a)

[2]

$$(b) 7y - 12 = 2(4y - 8)$$

$$7y - 12 = 2(4y - 8)$$

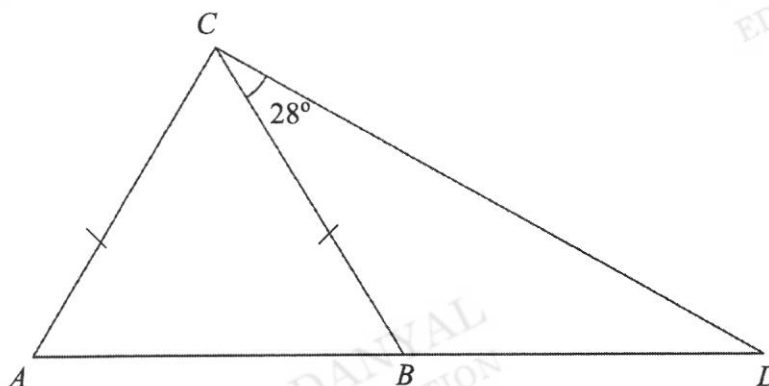
$$7y - 12 = 8y - 16 \quad [M1]$$

$$8y - 7y = 16 - 12 \quad [M1]$$

$$y = 4 \quad [A1]$$

Answer (b)..... [3]

5. $\triangle ABC$ and $\triangle DCB$ are isosceles triangles where $AC = BC = BD$ and $\angle BCD = 28^\circ$.



Find

- (a) $\angle CBD$

$$\angle CBD = 180 - 28 - 28 \text{ (isos.)}$$

$$= 124 \quad [B1]$$

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

- (b) $\angle CAB$

$$\angle CBA = 180 - 124 \text{ (}\angle\text{s on a str. line)}$$

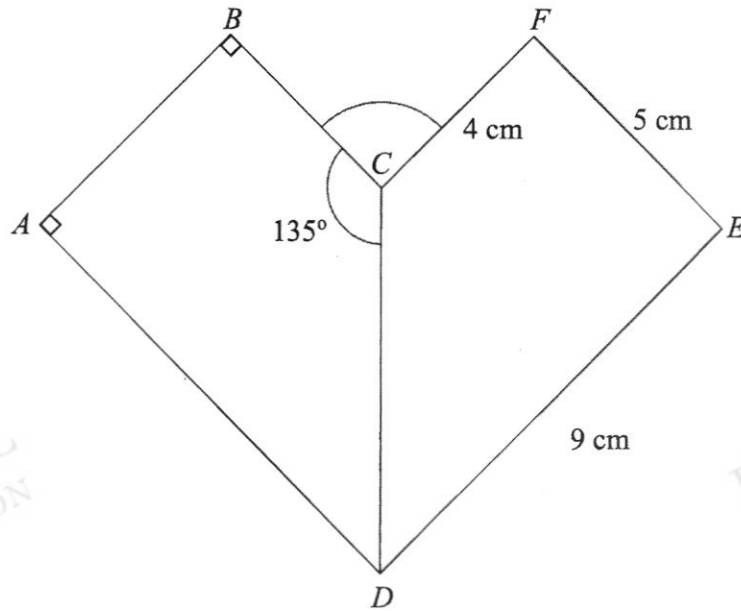
$$= 56 \quad [M1]$$

$$\angle CAB = \angle CBA \text{ (isos.)}$$

$$= 56 \quad [A1]$$

Answer (b)..... [2]

6. Trapezium $ABCD$ is congruent to trapezium $EFCD$.



- (a) State the length of AD and AB .

$$AD = ED \text{ (} ABCD \text{ is congruent to } EFCD \text{)}$$

$$= 9 \text{ cm}$$

[B1]

$$AB = EF \text{ (} ABCD \text{ is congruent to } EFCD \text{)}$$

$$= 5 \text{ cm}$$

[B1]

Answer (a) $AD = \dots\dots\dots$, $AB = \dots\dots\dots$ [2]

- (b) Calculate $\angle BCF$.

$$\angle FCD = \angle BCD \text{ (} ABCD \text{ is congruent to } EFCD \text{)}$$

$$= 135$$

[M1]

$$\angle BCF = 360 - 135 - 135 \text{ (} \angle \text{s at a pt.)}$$

[M1]

$$= 90$$

[A1]

Answer (b)..... [3]

7. The table below shows the corresponding x and y values for the equation $y = 3x + 2$.

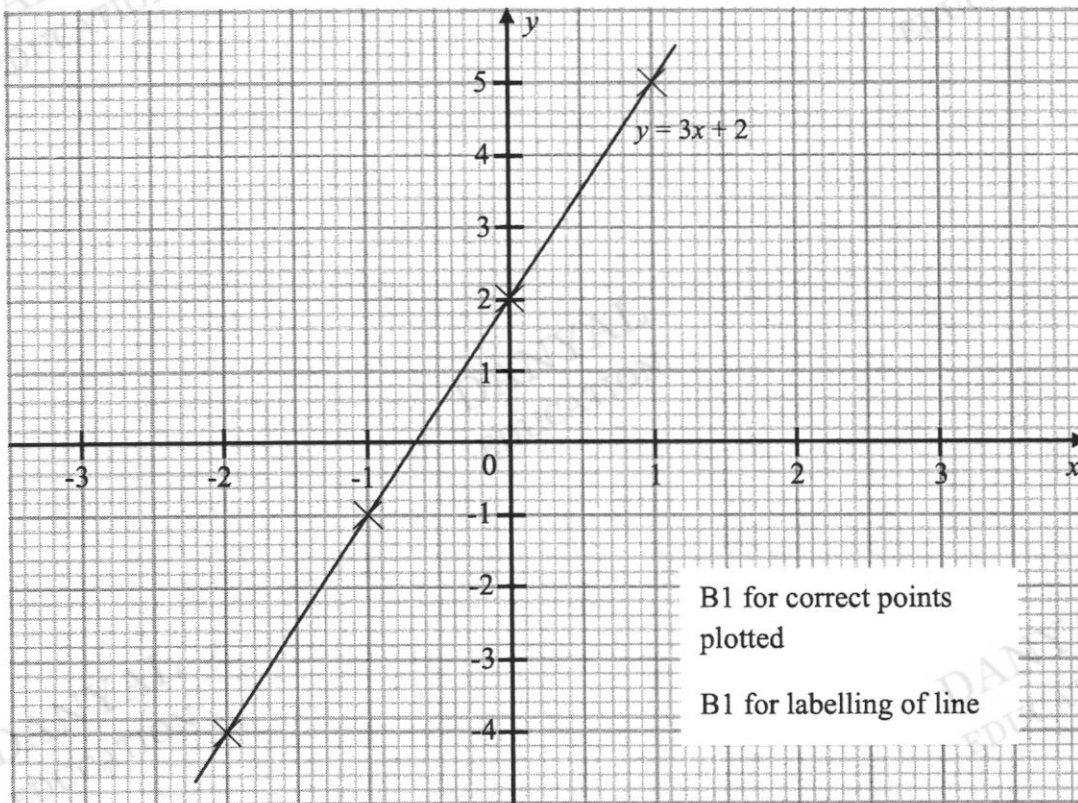
x	-2	-1	b	1
y	a	-1	2	5

(a) Find the values of a and b .

$y = 3x + 2$ $a = 3(-2) + 2$ $a = -4$	[B1]	$y = 3x + 2$ $2 = 3(b) + 2$ $b = 0$	[B1]
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Answer (b) $a = \dots\dots\dots$, $b = \dots\dots\dots$ [2]

(b) Draw the graph of $y = 3x + 2$ on the grid provided below. [2]



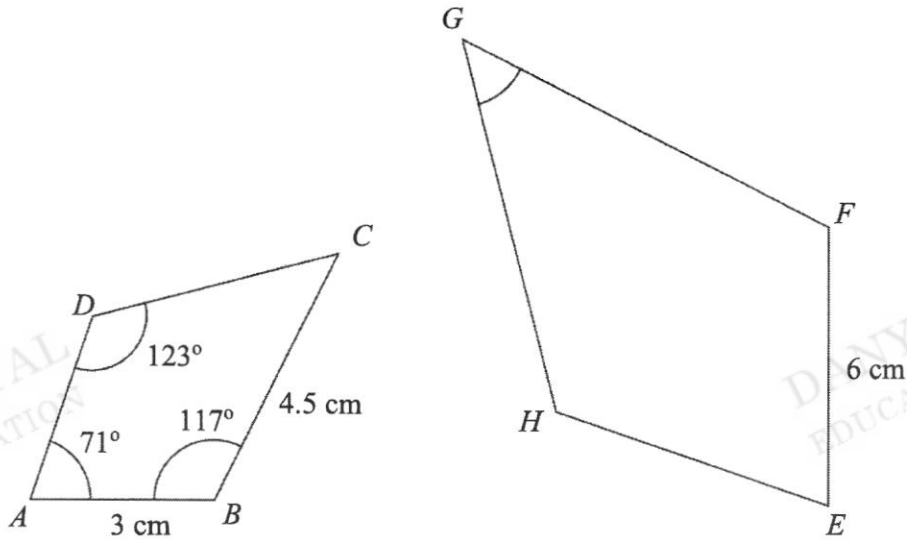
(c) From graph, write down the coordinates of the point where the line cuts the y -axis.

(0, 2) [B1]

Answer (c)..... [1]

Section B (22 marks)

8. Quadrilateral $ABCD$ is similar to $EFGH$.



(a) State $\angle HEF$.

$\angle HEF = 71$ ($ABCD$ is similar to $EFGH$) [B1]

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

(b) Calculate the length of GF .

$GF = 4.5 \times 2$ [M1]
 $= 9\text{cm}$ [A1]

Answer (b)..... [2]

(c) Find the unknown angle $\angle FGH$.

$\angle BCD = 360 - 71 - 117 - 123$ (\angle sum of a quad.) [M1]
 $= 49^\circ$
 $\angle FGH = \angle BCD$ ($ABCD$ is similar to $EFGH$)
 $= 49^\circ$ [A1]

Answer (c)..... [2]

9. Mary is travelling to Malaysia and Marcus is travelling to Japan. The table below shows the currency conversion rates for both Malaysia and Japan.

Exchange Rates
Singapore SGD\$100 = Malaysia Ringgit MYR\$298
Singapore SGD\$100 = Japan Yen JPY\$813

- (a) Albert wishes to convert SGD\$1000 into JPY\$ for his trip. Calculate the amount of JPY\$ he would have.

$$\begin{aligned} \text{SGD\$1000} &= 813 \times 10 && \text{[M1]} \\ &= \text{JPY\$8130} && \text{[A1]} \end{aligned}$$

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

- (b) Mary brought MYR\$5000 for her trip.

Calculate the amount of SGD\$ that she converted, giving your answer to 2 decimal place.

$$\begin{aligned} \text{MYR\$5000} &= \frac{5000}{298} \times 100 && \text{[M1]} \\ &= \text{SGD\$1677.85 (2dp)} && \text{[A1]} \end{aligned}$$

Answer (b)..... [2]

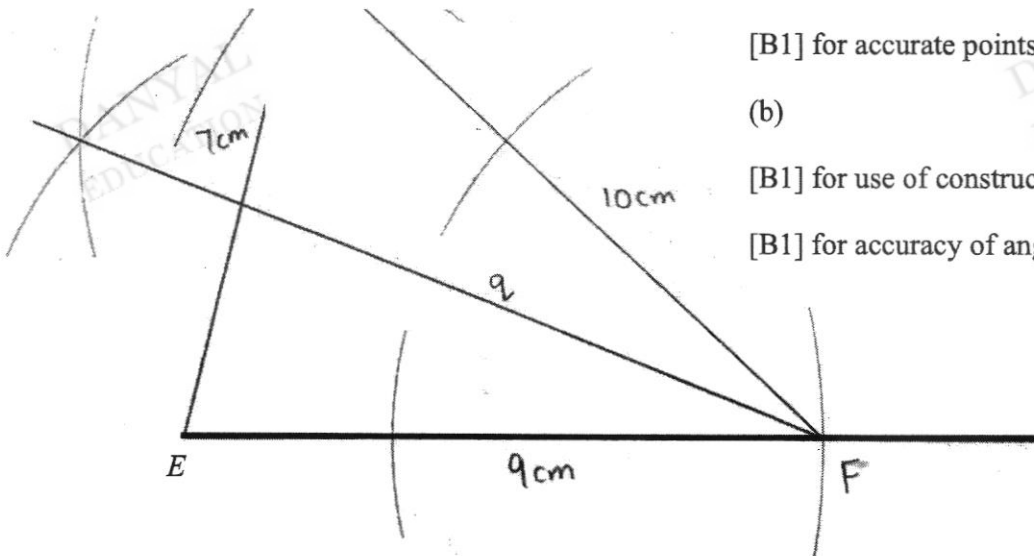
10. Jason cycles from his house for 10 minutes before stopping for 45 seconds at a traffic junction. He then cycles for another 14 minutes before reaching school. If the distance between his house and the school is 2090 m, calculate his average speed in m/s. Give your answer to 2 decimal places.

Total time = 10 min + 14 min + 45 seconds	[M1]
= 1485 seconds	[M1]
Avg. speed = 2090 ÷ 1485	[M1]
= 1.41 m/s (2dp)	[A1]

Answer [4]

11. A line with point E is drawn for you in the space below.

- (a) Construct $\triangle EFG$ where $EF = 9$ cm, $FG = 10$ cm and $EG = 7$ cm. [3]
 (b) Construct and label q which is the angle bisector of $\angle EFG$. [2]

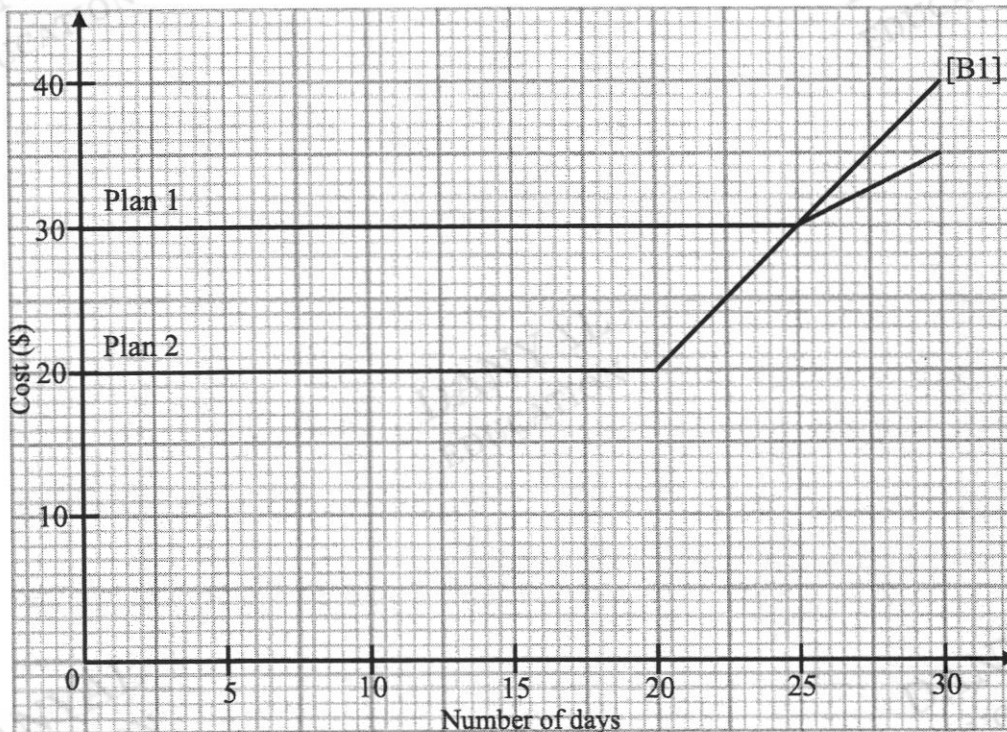


- (a)
 [B1] for use of construction lines
 [B1] for accurate points G and F drawn
 (b)
 [B1] for use of construction lines
 [B1] for accuracy of angle bisector drawn

12. A private bicycle park offers its customers two season parking plans.

	Plan 1	Plan 2
Basic monthly payment	\$30	\$20
Number of days with free parking	25	20
Cost for each day above the free parking	\$1	\$2

Below shows the graph of charges for Plan 1 and part of the graph for Plan 2 for a month with 30 days.



- (a) Using data from the table, complete the graph for Plan 2. [1]
- (b) David wants to park his bicycle for a total of 30 days, which plan should David choose if he wants the cheapest plan? Explain your answer.

David should choose plan 1. [B1]
 This is because plan 1 is cheaper than plan 2 by \$5. [B1] [2]

- (c) Jacky mentioned that it does not matter if he takes Plan 1 or Plan 2 as he pays the same amount of money. State the number of days that Jacky is parking at the bicycle park.

Answer (c) 25 days [B1] [1]