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BEATTY SECONDARY SCHOOL
END-OF-YEAR EXAMINATION 2024
SECONDARY ONE G3

CANDIDATE
NAME

CLASS

REGISTER
NUMBER

MATHEMATICS

2 October 2024
2 hours

Candidates answer on the Question Paper
Additional Materials: NIL

READ THESE INSTRUCTIONS FIRST

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

Answer **all** 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 of the marks for this paper is 80.

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.

For Examiner's Use

[Turn Over

- 1 (a) Write the following numbers in order of size, starting with the **smallest**.

$$0.85, \quad \sqrt{0.85}, \quad 0.85\%, \quad \left(\frac{4}{5}\right)^2$$

Answer,,, [1]

- (b) Calculate $\frac{12.56}{23.9 - 4.87^2}$. Leave your answer correct to 2 significant figures.

Answer [1]

- 2 Factorise completely each of the following expressions.

(a) $15xy - 27yz$,

Answer [1]

(b) $-4a - 32ab - 12ac$,

Answer [1]

(c) $2x(a - 4b) - y(a - 4b)$.

Answer [1]

- 3 (a) Express 1960 as a product of its prime factors in index notation.

Answer $1960 = \dots\dots\dots$ [1]

- (b) Written as a product of its prime factors, $2646 = 2 \times 3^3 \times 7^2$.

- (i) Write down the HCF of 1960 and 2646.

Answer $\dots\dots\dots$ [1]

- (ii) Write down the smallest integers p and q such that $\frac{2646p}{q}$ is a perfect cube.

Answer $p = \dots\dots\dots$ [1]

$q = \dots\dots\dots$ [1]

[Turn over

4 Wong bought a bag for \$95.95 and two shirts which costs \$39.80 each.

- (a) By rounding off each number to 1 significant figure, estimate Wong's spending altogether.

Answer \$ [2]

- (b) Without doing further calculation, explain why Wong's actual spending is lesser or more than the estimated spending.

Answer

.....

..... [1]

5 (a) Expand and simplify $2(x + 2y) - 3(2x - y)$.

Answer [2]

- (b) Express $\frac{3x-2}{5} + \frac{4x+7}{3}$ as a single fraction in its simplest form.

Answer [3]

- 6 (a) Alex, Ben and Claire shared a sum of money between them in the ratio of 5 : 3 : 8.
Ben has \$186 less than Alex.
Find the total amount of money they have altogether.

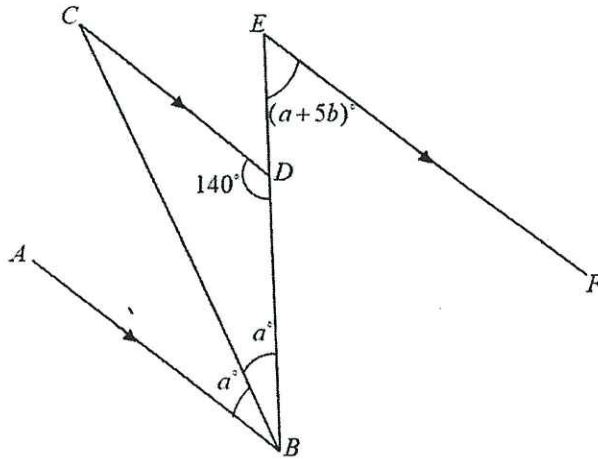
Answer [2]

- (b) Pete bought 2 watermelons at \$ m each and a bag of grapes for \$12. He paid with a 50 dollar note and received y cents in return.
Find an expression for m in terms of y .

Answer \$ [2]

[Turn over]

- 7 In the diagram, AB , CD and EF are parallel to each other. Angle $ABC = \text{angle } CBD = a^\circ$, angle $CDB = 140^\circ$ and angle $DEF = (a + 5b)^\circ$.



Find, stating the reasons,

- (a) reflex angle CDB ,

Answer [1]

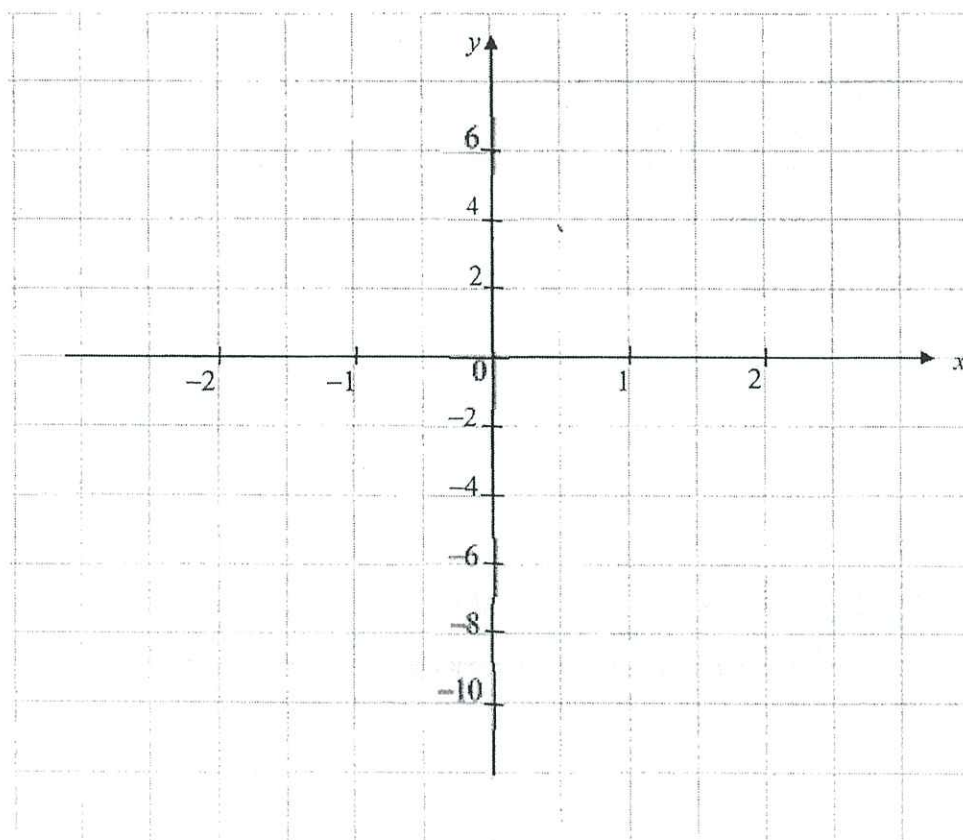
- (b) the value of a and of b .

Answer $a = \dots\dots\dots$, $b = \dots\dots\dots$ [4]

- 8 (a) Complete the table of values for $y = 3x - 2$.

x	-2	-1	0	1	2
y	-8		-2	1	4

[1]



- (b) On the grid, draw the graph of $y = 3x - 2$ for $-2 \leq x \leq 2$.

[2]

- (c) Using your graph, find the value of x when $y = -6$.

Answer $x = \dots\dots\dots$ [1]

- (d) On the same grid, draw the graph of $y = 2$.

[1]

[Turn over

- 9 Tang drove 240 km from Singapore to Malacca at 85 km/h.

(a) Express 85 km/h in m/s.

Answer m/s [1]

(b) Find the time taken by Tang to reach Malacca.
Leave your answer in hours and minutes, to the nearest minutes.

Answer hoursminutes [2]

(c) Tang then drove to Kuala Lumpur at 92 km/h and he arrived at his destination in 1 hour 35 minutes.
Find his average speed for the journey from Singapore to Kuala Lumpur.

Answer km/h [3]

(d) The petrol consumption for his car is 8 litres per 100 km.
Find the petrol consumption for his journey from Singapore to Kuala Lumpur.

Answer litres [1]

- 10 In a sequence, the same number is subtracted each time to obtain the next term.
The first five terms of the sequence are

27, p , q , r , 3.

- (a) Find the values of p , q and r .

Answer $p =$ [1]

$q =$ [1]

$r =$ [1]

- (b) Write down an expression, in terms of n , for the n th term.

Answer [1]

- (c) Is -107 a term of this sequence?
Show your working and give a reason to support your answer.

Answer

..... [2]

[Turn over

- 11 (a) Construct a quadrilateral $PQRS$ such that $QR = 10$ cm, $RS = 11$ cm, $PS = 7$ cm and $\angle PQR = 100^\circ$. The side PQ has been drawn for you.
All construction arcs and lines must be clearly shown.

Answer

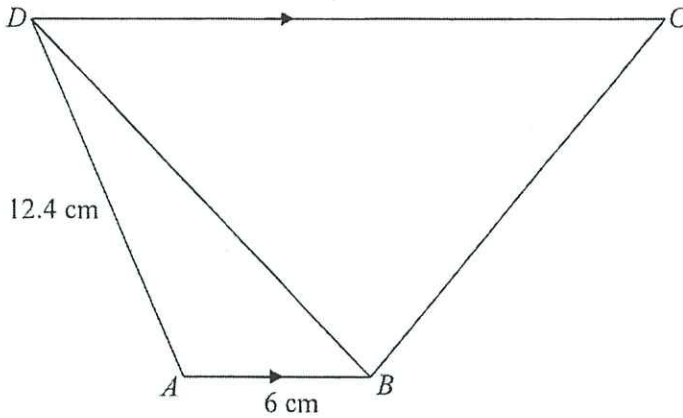
[3]



- (b) Write down the size of angle PSR .

Answer [1]

- 12 In the diagram, $ABCD$ is a trapezium where AB is parallel to DC .
 $AB = 6$ cm, $AD = 12.4$ cm and the perimeter of the trapezium $ABCD$ is 53.4 cm.



- (a) Given that $BC : CD = 3 : 4$, show that the length of CD is 20 cm.

Answer

[2]

- (b) The area of trapezium $ABCD$ is 150.8 cm^2 . Find the area of the triangle ABD .

Answer cm^2 [4]

[Turn over]

- 13 A shop is selling chocolate cookies on two different offers.

	Offer A	Offer B
Original Price	200 g costs \$4.80	360 g costs \$6
Promotion	25% extra free	10% off the price

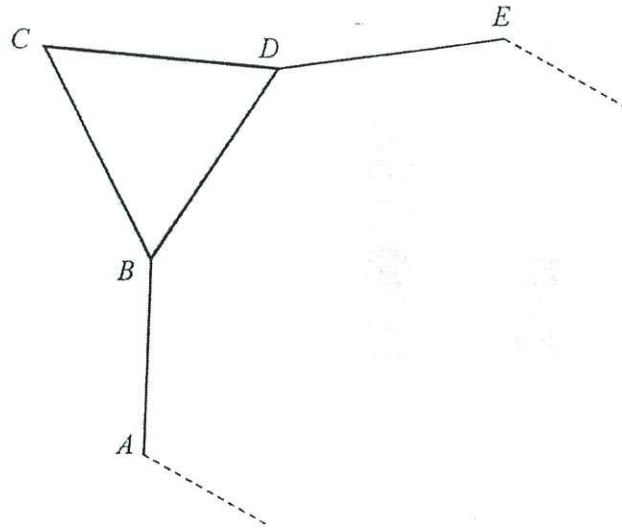
Showing **your working clearly**, explain which offer is better value for money.

Answer

Offer is better value for money.

[4]

- 14 The diagram shows an equilateral triangle BCD and the three sides, AB , BD and DE of a regular polygon. The interior angle of the polygon is 100° more than its exterior angle.



- (a) Find the number of sides of the polygon.

Answer [3]

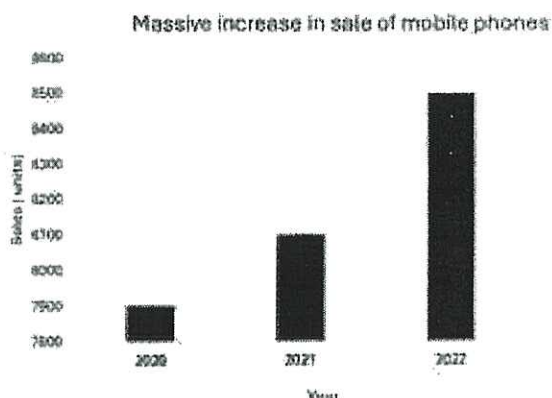
- (b) Jane claimed that angle CDE is the interior angle of another regular polygon. Do you agree with Jane? Justify your decision.

Answer

[3]

[Turn over

- 15 (a) The diagram shows the sales of mobile phone in a company at the end of each of the given year.



- (i) State one misleading feature of the graph.

Answer [1]

- (ii) Explain how this feature affects the reader's interpretation of the graph.

Answer [1]

- (b) The time, in minutes, taken by 20 students to complete their homework on a particular day is shown below.

15	40	20	55	60	25	18	28	25	33
58	35	14	38	28	40	50	33	46	27

- (i) Complete the frequency table below.

Answer

Time (x minutes)	Tally	Frequency
$0 < x \leq 15$		
$15 < x \leq 30$		
$30 < x \leq 45$		
$45 < x \leq 60$		

[2]

- (ii) The data is represented on a pie chart. Calculate the angle of the sector which represents the data $30 < x \leq 45$.

Answer [1]

16 Solve the following equations.

(a) $2(x-4)+5=4x+7$

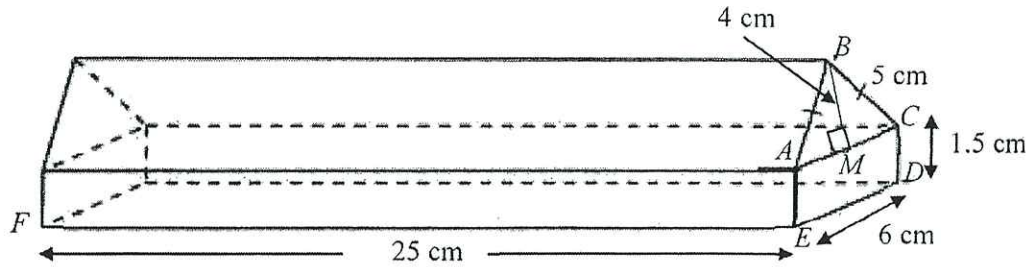
Answer $x = \dots\dots\dots$ [2]

(b) $\frac{8}{2x+5} = \frac{5}{1-3x}$

Answer $x = \dots\dots\dots$ [3]

[Turn over

- 17 Tony ordered a new wooden nameplate for his office desk as shown in the diagram below. The nameplate is made of an isosceles triangular prism attached to a 1.5 cm high rectangular prism base. $AB = BC = 5$ cm, $ED = 6$ cm, $EF = 25$ cm and the perpendicular height of the triangle ABC is 4 cm.



- (a) Find the volume of the wooden nameplate.

Answer cm^3 [3]

- (b) Find the total surface area of the wooden name plate.

Answer cm^2 [3]



BEATTY SECONDARY SCHOOL
END-OF-YEAR EXAMINATION 2024
SECONDARY ONE G3

MARK SCHEME

CANDIDATE
NAME

CLASS

REGISTER
NUMBER

MATHEMATICS

Setter: Mrs Samsol

2 October 2024
2 hours

Candidates answer on the Question Paper
Additional Materials: NIL

READ THESE INSTRUCTIONS FIRST

Write your name, class and register number on all the work you hand in.
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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 of the marks for this paper is 80.

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.

For Examiner's Use

This document consists of 16 printed pages and 0 blank page.

[Turn Over

- 1 (a) Write the following numbers in order of size, starting with the **smallest**.

$$0.85, \sqrt{0.85}, 0.85\%, \left(\frac{4}{5}\right)^2$$

$$0.85\%, \left(\frac{4}{5}\right)^2, 0.85, \sqrt{0.85} \quad \dots\dots B1$$

Answer,,, [1]

- (b) Calculate $\frac{12.56}{23.9 - 4.87^2}$. Leave your answer correct to 2 significant figures.

$$= 69 \quad \dots\dots B1$$

Answer [1]

- 2 Factorise completely each of the following expressions.

(a) $15xy - 27yz$,
 $= 3y(5x - 9z) \quad \dots\dots B1$

Answer [1]

(b) $-4a - 32ab - 12ac$,
 $= -4a(1 + 8b + 3c) \quad \dots\dots B1$

Answer [1]

(c) $2x(a - 4b) - y(a - 4b)$.
 $= (a - 4b)(2x - y) \quad \dots\dots B1$

Answer [1]

- 3 (a) Express 1960 as a product of its prime factors in index notation.

$$1960 = 2^3 \times 5 \times 7^2 \dots\dots\dots \text{B1}$$

$$\text{Answer } 1960 = \dots\dots\dots [1]$$

- (b) Written as a product of its prime factors, $2646 = 2 \times 3^3 \times 7^2$

- (i) Write down the HCF of 1960 and 2646.

$$\begin{aligned} \text{HCF} &= 2 \times 7^2 \\ &= 98 \dots\dots\dots \text{B1} \end{aligned}$$

$$\text{Answer } \dots\dots\dots [1]$$

- (ii) Write down the smallest integers p and q such that $\frac{2646p}{q}$ is a perfect cube.

$$\frac{2 \times 3^3 \times 7^2 p}{q}$$

$$p = 7 \dots\dots\dots \text{B1}$$

$$q = 2 \dots\dots\dots \text{B1}$$

$$\text{Answer } p = \dots\dots\dots [1]$$

$$q = \dots\dots\dots [1]$$

4 Wong bought a bag for \$95.95 and two shirts which costs \$39.80 each.

- (a) By rounding off each number to 1 significant figure, estimate the total cost of Wong's spending.

$$\begin{aligned} \text{Estimated cost} &= 100 + 2(40) && \text{M1 [rounding to 1 sf]} \\ &= \$180 && \text{A1} \end{aligned}$$

Answer \$ [2]

- (b) Without doing further calculation, explain why Wong's actual spending is lesser or more than the estimated spending.

Answer Actual spending is lesser than the estimated amount because the amount used in the calculation is higher than the actual amount. B1

.....
..... [1]

- 5 (a) Expand and simplify $2(x + 2y) - 3(2x - y)$.

$$\begin{aligned} &2(x + 2y) - 3(2x - y) \\ &= 2x + 4y - 6x + 3y && \text{..... M1} \\ &= -4x + 7y && \text{..... A1} \end{aligned}$$

Answer [2]

- (b) Express $\frac{3x-2}{5} + \frac{4x+7}{3}$ as a single fraction in its simplest form.

$$\begin{aligned} & \frac{3x-2}{5} + \frac{4x+7}{3} \\ &= \frac{3(3x-2) + 5(4x+7)}{15} \quad \text{..... M1[combine into single fraction]} \\ &= \frac{9x-6+20x+35}{15} \quad \text{..... M1[expansion]} \\ &= \frac{29x+29}{15} \quad \text{..... A1} \end{aligned}$$

Answer [3]

- 6 (a) Alex, Ben and Claire shared a sum of money between them in the ratio of 5 : 3 : 8.

Ben has \$186 less than Alex.

Find the total amount of money they have altogether.

$$2 \text{ units} = 186$$

Total amount

$$= \frac{16}{2} \times 186 \quad \text{..... M1}$$

$$= \$1488 \quad \text{..... A1}$$

Answer [2]

- (b) Pete bought 2 watermelons at \$ m each and a bag of grapes for \$12. He paid with a 50 dollar note and received y cents in return.

Find an expression for m in terms of y .

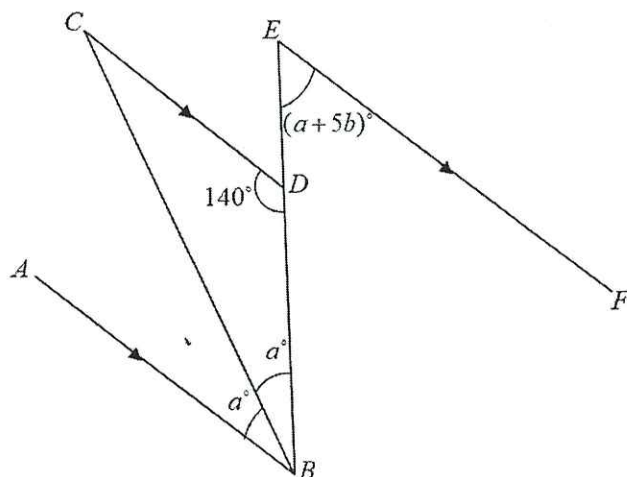
$$2m + 12 = 50 - \frac{y}{100} \quad \text{..... B1[for } \frac{y}{100} \text{]}$$

$$2m = 38 - 0.01y$$

$$m = 19 - 0.005y \quad \text{or } 19 - \frac{y}{200} \quad \text{..... B1}$$

Answer \$ [2]

- 7 In the diagram, AB , CD and EF are parallel to each other. Angle $ABC = \text{angle } CBD = a^\circ$, angle $CDB = 140^\circ$ and angle $DEF = (a + 5b)^\circ$.



Find, stating the reasons,

- (a) reflex angle CDB ,

$$= 360^\circ - 140^\circ$$

$$= 220^\circ \quad (\angle\text{s at a point}) \dots\dots\dots \text{B1}$$

Answer [1]

- (b) the value of a and of b .

$$\angle EDC = 40^\circ \quad (\text{adjacent } \angle\text{s on straight line}) \dots\dots \text{M1}$$

$$2a = \angle EDC = 40^\circ \quad (\text{corresponding } \angle\text{s, } AB \parallel CD)$$

$$a = 20 \quad \dots\dots\dots \text{A1}$$

$$a + 5b = 2a$$

$$20 + 5b = 40 \quad (\text{alternate } \angle\text{s, } AB \parallel EF) \dots\dots \text{M1}$$

$$5b = 20$$

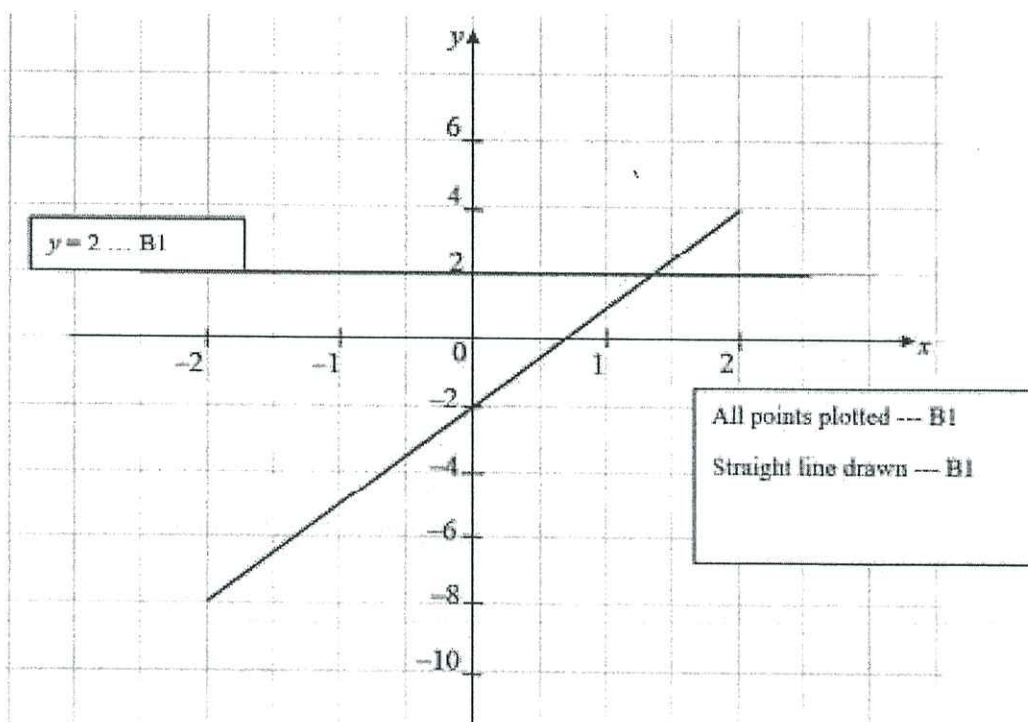
$$b = 4 \quad \dots\dots\dots \text{A1}$$

Answer $a = \dots\dots\dots$, $b = \dots\dots\dots$ [4]

- 8 (a) Complete the table of values for $y = 3x - 2$.

x	-2	-1	0	1	2
y	-8	-5 [B1]	-2	1	4

[1]



[2]

- (b) On the grid, draw the graph of $y = 3x - 2$ for $-2 \leq x \leq 2$.

- (c) Using your graph, find the value of x when $y = -6$.

$x = -1.35$, -1.4 or -1.45 B1

Answer $x =$ [1]

- (d) On the same grid, draw the graph of $y = 2$.

[1]

- 9 Tang drives 240 km from Singapore to Malacca at 85 km/h.

- (a) Express 85 km/h in m/s.

$$85 \text{ km/h} = 23.6 \text{ m/s (3 sf) B1 [accept } 23\frac{11}{18} \text{ or } 23.6\dot{1}]$$

Answerm/s [1]

- (b) Find the time taken by Tang to reach Malacca. Leave your answer in hours and minutes, to the nearest minutes.

$$\begin{aligned} &\text{Time taken} \\ &= \frac{240}{85} \text{ M1} \\ &= 2.8235\text{...hours} \\ &= 2 \text{ hours } 49 \text{ minutes A1} \end{aligned}$$

Answer hoursminutes [2]

- (c) Tang then drives to Kuala Lumpur at 92 km/h and he arrives at his destination in 1 hour 35 minutes.

Find his average speed for the journey from Singapore to Kuala Lumpur.

Distance to KL

$$\begin{aligned} &= 92 \times 1\frac{35}{60} \text{ M1} \\ &= 145\frac{2}{3} \text{ km} \end{aligned}$$

Average speed

$$\begin{aligned} &= \frac{240 + 145\frac{2}{3}}{2\frac{49}{60} + 1\frac{35}{60}} \text{ M1 } \sqrt{\text{use of } \frac{\text{total distance}}{\text{total time}}} \\ &= 87.6515 \\ &= 87.7 \text{ km/h A1} \end{aligned}$$

[Accept 87.6 km/h, 87.5 km/h, 87.4 km/h, 87.3 km/h or equivalent]

Answer km/h [3]

- (d) The petrol consumption for his car is 8 litres per 100 km.

Find the petrol consumption for his journey from Singapore to Kuala Lumpur.

$$\begin{aligned} \text{amount of petrol} &= \frac{240 + 145\frac{2}{3}}{100} \times 8 \\ &= 30.9 \text{ litres B1 } \sqrt{} \end{aligned}$$

Answer litres [1]

- 10 In a sequence, the same number is subtracted each time to obtain the next term.
The first five terms of the sequence are

27, p , q , r , 3.

- (a) Find the values of p , q and r .

Let a be the constant value added.

$$27 + 4a = 3$$

$$a = \frac{3-27}{4}$$

$$a = -6$$

$$p = 21 \dots\dots\dots \text{B1}, \quad q = 15 \dots\dots\dots \text{B1}, \quad r = 9 \dots\dots\dots \text{B1}$$

$$\text{Answer } p = \dots\dots\dots [1]$$

$$q = \dots\dots\dots [1]$$

$$r = \dots\dots\dots [1]$$

- (b) Write down an expression, in terms of n , for the n th term.

$$n\text{th term} = 33 - 6n \dots\dots\dots \text{B1}$$

[Accept $n\text{th term} = 27 - 6(n-1)$]

$$\text{Answer } \dots\dots\dots [1]$$

- (c) Is -107 a term of this sequence?

Show your working and give a reason to support your answer.

$$33 - 6n = -107 \dots\dots\dots \text{M1}$$

$$-6n = -140$$

$$n = 23\frac{1}{3}$$

Since $n = 23\frac{1}{3}$ is not a positive integer, -107 is not a term in this sequence. A1

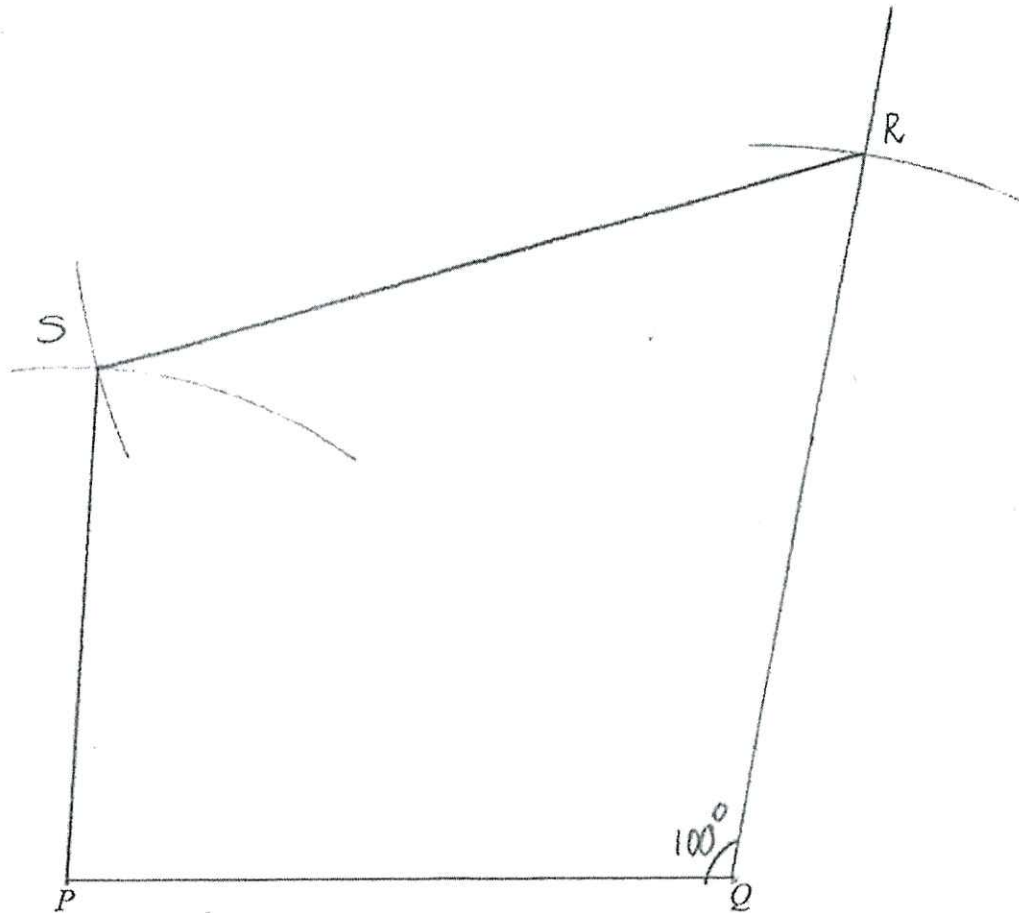
Answer

..... [2]

- 1 (a) Construct a quadrilateral $PQRS$ such that $QR = 10$ cm, $RS = 11$ cm, $PS = 7$ cm and $\angle PQR = 100^\circ$. The side PQ has been drawn for you. All construction arcs and lines must be clearly shown.

Answer

[3
]



G1 – either 100° or length of 10 cm from Q, with arc clearly shown

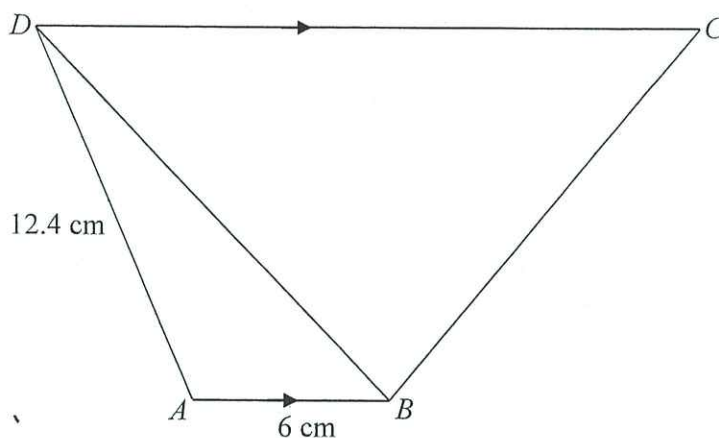
G1 – 7 cm from P with arc or 11 cm from R with arc shown

G1- complete drawing and labelling of $PQRS$.

- (b) Write down the size of angle PSR .

Answer $108^\circ \pm 1^\circ$ B1... [1]

- 12 In the diagram, $ABCD$ is a trapezium where AB is parallel to DC .
 $AB = 6$ cm, $AD = 12.4$ cm and the perimeter of the trapezium $ABCD$ is 53.4 cm.



- (a) Given that $BC : CD = 3 : 4$, show that the length of CD is 20 cm.

Answer

[2]

Length of BC and CD

$$= 53.4 - 12.4 - 6 \dots\dots\dots \text{M1}$$

$$= 35$$

Length of CD

$$= \frac{4}{7} \times 35$$

$$= 20 \text{ cm}$$

} A1

- (b) The area of trapezium $ABCD$ is 150.8 cm^2 . Find the area of the triangle ABD .
 $BC = 15 \text{ cm}$

$$\frac{1}{2}(6 + 20)h = 150.8 \dots\dots\dots \text{M1 [area of trapezium]}$$

$$h = \frac{150.8}{13} \text{ or } 11.6 \dots\dots\dots \text{A1 [it is an exact answer]}$$

Area of triangle ABD

$$= \frac{1}{2}(6)(11.6) \dots\dots\dots \text{M1✓}$$

$$= 34.8 \text{ cm}^2 \dots\dots\dots \text{A1}$$

Answer cm^2 [4]

- 13 A shop is selling the same chocolate bar on two different offers.

	Offer A	Offer B
Original Price	200 g costs \$4.80	360 g costs \$6
Promotion	25% extra free	10% off the price

Showing **your working clearly**, explain which offer is better value for money.

Answer

Offer A

$$\text{Total mass} = \frac{125}{100} \times 200 = 250 \text{ g} \dots\dots\dots \text{M1}$$

Cost per 100 g

$$= \frac{4.80}{250} \times 100$$

$$= \$1.92$$

$\dots\dots\dots \text{M1}$

Offer B

Cost for 100 g

$$= \frac{6}{360} \times 100 \times 0.9 \dots\dots\dots \text{M1}$$

$$= \$1.50$$

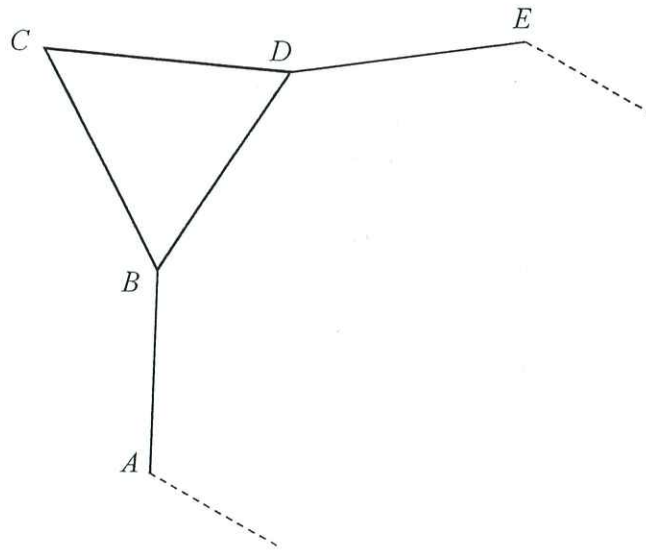
any calculation of cost per unit mass

Since $\$1.50 < \1.92 , offer B is cheaper and better value for money
 .. A1[writing a conclusion]

Offer is better value for money.

[4]

- 14 The diagram shows an equilateral triangle BCD and the three sides, AB , BD and DE of a regular polygon. The interior angle of the polygon is 100° more than its exterior angle.



- (a) Find the number of sides of the polygon.

Let exterior angle be x and interior angle be $(x + 100)^\circ$.

$$x + x + 100 = 180 \dots\dots\dots \text{M1}$$

$$2x = 80$$

$$x = 40 \dots\dots\dots \text{A1}$$

$$\begin{aligned} \text{number of sides} &= \frac{360}{40} \\ &= 9 \dots\dots\dots \text{A1} \end{aligned}$$

Answer [3]

- (b) Jane claimed that CDE is the interior angle of another regular polygon. Do you agree with Jane? Justify your decision.

Answer

Angle CDE

[3]

$$= 360 - 140 - 60 \dots\dots\dots \text{M1} \checkmark$$

$$= 160$$

$$\frac{(n-2)180}{n} = 160 \dots\dots\dots \text{M1} \checkmark \quad \text{or}$$

$$\text{exterior angle} = 20^\circ$$

$$\text{number of sides} = \frac{360}{20} = 18 \dots\dots \text{M1} \checkmark$$

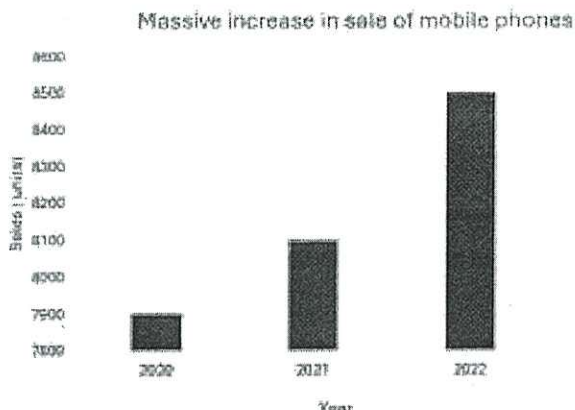
$$180n - 360 = 160n$$

$$20n = 360$$

$$n = 18$$

Since n is a positive integer ≥ 3 , it is possible that CDE is the interior angle of another regular polygon. I agree with Jane. A1 [writing a conclusion]

- 15 (a) The diagram shows the sales of mobile phone in a company at the end of each of the given year.



- (i) State one misleading feature of the graph.

Answer (i) Vertical scale did not start from zero/ truncated vertical axis

or (ii) Inaccurate/ misleading title / use of word like 'massive' in the title B1

[1]

- (ii) Explain how this feature affects the reader's interpretation of the graph.

Answer (i) Reader may think that the increase in sale from 2021 to 2022 is **more than double the actual percentage increase** B1. [quoting of % is good but not required]

or (ii) It **does not give the readers an opportunity to give their own opinion/ judgement or it primes the reader.....B1**

[1]

- (b) The time, in minutes, taken by 20 students to complete their homework on a particular day is shown below.

15	40	20	55	60	25	18	28	25	33
58	35	14	38	28	40	50	33	46	27

- (i) Complete the frequency table below.

Answer

Time (x minutes)	Tally	Frequency
$0 < x \leq 15$	//	2
$15 < x \leq 30$	//// //	7
$30 < x \leq 45$	//// /	6
$45 < x \leq 60$	////	5

B2 for all correct
B1 for at least 2 correct

- (ii) The data is represented on a pie chart. Calculate the angle of the sector which represents the data $30 < x \leq 45$.

$$\text{area of sector} = \frac{6}{20} \times 360$$

$$= 108^\circ \dots\dots\dots \text{B1}\checkmark$$

Answer [1]

16 Solve the following equations.

(a) $2(x-4)+5=4x+7$

$$2(x-4)+5=4x+7$$

$$2x-8+5=4x+7 \quad \text{..... M1 [expansion]}$$

$$-2x=10$$

$$x=-5 \quad \text{..... A1}$$

Answer $x = \text{.....}$ [2]

(b) $\frac{8}{2x+5} = \frac{5}{1-3x}$

$$\frac{8}{2x+5} = \frac{5}{1-3x}$$

$$5(2x+5)=8(1-3x) \quad \text{..... M1 [multiply by LCM]}$$

$$10x+25=8-24x$$

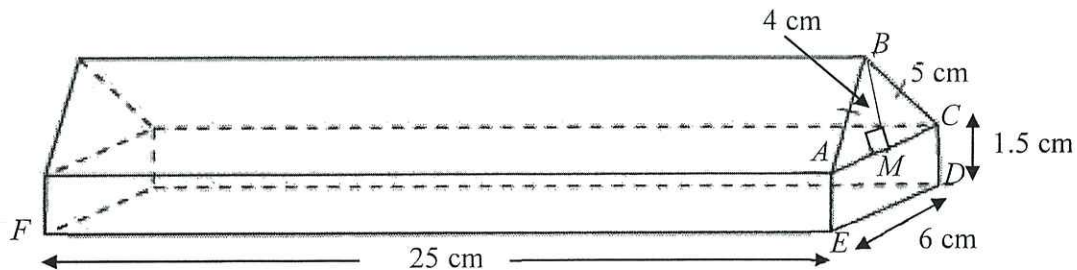
$$34x=-17 \quad \text{..... M1 [simplification]}$$

$$x = -\frac{17}{34}$$

$$x = -\frac{1}{2} \quad \text{..... A1}$$

Answer $x = \text{.....}$ [3]

- 17 Tony ordered a new wooden nameplate for his office desk as shown in the diagram below. The nameplate is made of an isosceles triangular prism attached to a 1.5 cm high rectangular prism base. $AB = BC = 5$ cm, $ED = 6$ cm, $EF = 25$ cm and the perpendicular height of the triangle ABC is 4 cm.



- (a) Find the volume of the wooden nameplate.

$$\text{cross-sectional area} = \frac{1}{2}(6)(4) + (1.5)(6) \dots \text{M1 [area of triangle], M1 [area of rectangle]}$$

$$= 21 \text{ cm}^2$$

$$\text{Volume of prism} = 21 \times 25$$

$$= 525 \text{ cm}^3 \dots \text{A1}$$

Answer cm^3 [3]

- (b) Find the total surface area of the wooden name plate.

$$\text{area of lateral surfaces} = (5 + 5 + 1.5 + 6 + 1.5)(25) \dots \text{M1}$$

$$= 475 \text{ cm}^2$$

$$\text{area of cross-section} = 2 \times 21 \dots \text{M1} \checkmark$$

$$= 42 \text{ cm}^2$$

$$\text{total surface area} = 475 + 42$$

$$= 517 \text{ cm}^2 \dots \text{A1}$$

Answer cm^2 [3]