

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

Pearson Edexcel
Level 1/Level 2 GCSE (9–1)

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Thursday 5 November 2020

Morning (Time: 1 hour 30 minutes)

Paper Reference **1MA1/2F**

Mathematics

Paper 2 (Calculator)

Foundation Tier

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working**.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.



Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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Pearson

Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 Write 0.37 as a fraction.

$$\frac{37}{100} \checkmark$$

(Total for Question 1 is 1 mark)

2 Write 29381 correct to the nearest 1000

↳ round down

$$29,000 \checkmark$$

(Total for Question 2 is 1 mark)

3 Simplify $3e - e + 4e$

$$2e + 4e$$

$$6e$$

$$6e \checkmark$$

(Total for Question 3 is 1 mark)

4 Write $\frac{1}{4}$ as a percentage.

$$\frac{1}{4} \xrightarrow{\times 25} \frac{25}{100}$$

$$\frac{1}{4} = \frac{25}{100}$$

$$25 \checkmark \%$$

(Total for Question 4 is 1 mark)

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5 Here is a list of numbers.

3 4 9 18 27 30 36 $\rightarrow 3 \times 3 \times 3 = 3^3$

From the numbers in the list, write down a **cube number**.

$\hookrightarrow n^3$

27 ✓

(Total for Question 5 is 1 mark)

6 Liz is **watching a film at the cinema**.

The **film started at 14:30**

The film is **105 minutes long**. $\rightarrow 1 \text{ hr } 105 - 60 \text{ min} \rightarrow 1 \text{ hr } 45 \text{ min} \checkmark$

When the film ends, **Liz takes 20 minutes to get to the bus stop**. $\rightarrow 45 \text{ min} + 20 \text{ min}$

A **bus leaves** the bus stop at **16:45**

Does Liz get to the bus stop **in time to get this bus?**

You **must show all your working**.

14:30

1:45

15:75 $\rightarrow 15 \text{ min past}$

16:00 + 15 min the hour

16:15

00:20

16:35 ✓

16:35 is before 16:45 and so yes

she does get there on

time. ✓

(Total for Question 6 is 3 marks)

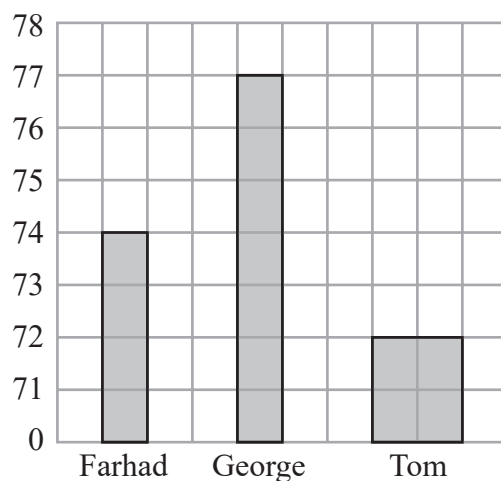


7 Farhad, George and Tom each did a test.

Here are their marks for the test.

Farhad	74
George	77
Tom	72

George drew this bar chart to show the marks they got.
The bar chart is not fully correct.



Write down two things that are wrong with George's bar chart.

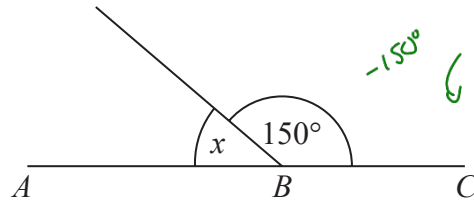
1. Bars are not the same width. ✓

2. Y-axis has no label (should be labelled mark). ✓

(Total for Question 7 is 2 marks)



8



$$\begin{aligned}
 x + 150^\circ &= 180^\circ && \downarrow -150^\circ \\
 x &= 180^\circ - 150^\circ \\
 &= 30^\circ
 \end{aligned}$$

ABC is a straight line.

- (a) (i) Work out the size of the angle marked x .

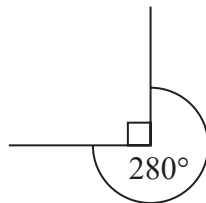
30 ✓ °
(1)

- (ii) Give a reason for your answer.

angles on a straight line sum to 180° ✓

(1)

The diagram below is wrong.



- (b) Explain why.

Angles around point sum to 360°. Diagram shows a total sum of $90^\circ + 280^\circ = 370^\circ$

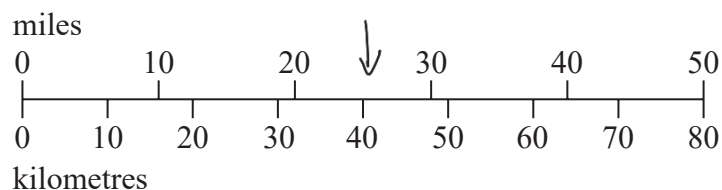
$370^\circ \neq 360^\circ$ therefore is wrong. ✓
(1)

(Total for Question 8 is 3 marks)



P 6 2 2 7 5 A 0 5 2 4

- 9 This scale can be used to change between kilometres and miles.



- (a) Use the scale to change 40 kilometres to miles.

..... 25 ✓₁ miles
(1)

Here is an approximate rule to change from kilometres to miles.

Divide the distance in kilometres by 10 and then multiply by 6

- (b) Use this approximate rule to change 40 kilometres to miles.

$$\frac{(\text{km})}{10} \times 6 \rightarrow \frac{40}{10} \times 6 \rightarrow 4 \times 6 = 24$$

..... 24 ✓₂ miles
(2)

- (c) Compare your answer to part (b) with your answer to part (a).

part a) gave us 25, part b) gave us 24

The two answers are quite close ✓₁

(1)

(Total for Question 9 is 4 marks)



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10 (a) Solve $3m = 36$

$$\begin{aligned} \div 3 \quad \downarrow \quad 3m &= 36 \quad \downarrow \div 3 \\ m &= \frac{36}{3} = 12 \end{aligned}$$

$$m = 12 \checkmark$$

(1)

(b) Solve $7 - x = 3$

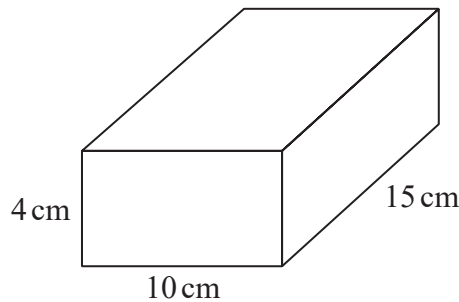
$$\begin{aligned} +x \quad \downarrow \quad 7 - x &= 3 \quad \downarrow +x \\ 7 &= 3 + x \quad \downarrow +x \\ -3 \quad \downarrow \quad 7 - 3 &= x \quad \downarrow -3 \\ 4 &= x \end{aligned}$$

$$x = 4 \checkmark$$

(1)

(Total for Question 10 is 2 marks)

11 Here is a cuboid.



$$\begin{aligned} V &= L \times w \times d \\ &= 10 \text{ cm} \times 4 \text{ cm} \times 15 \text{ cm} \\ &= \begin{array}{r} \times 15 \\ 4 \\ \hline 60 \\ 2 \end{array} \end{aligned}$$

Work out the volume of the cuboid.

$$\begin{aligned} &= 10 \text{ cm} \times 60 \text{ cm}^2 \checkmark_1 \\ &= 600 \text{ cm}^3 \checkmark_3 \end{aligned}$$

$$600 \text{ cm}^3 \checkmark$$

(Total for Question 11 is 3 marks)



12 Lucy uses a code to open a lock.

The code is a letter followed by a 2-digit number.

The letter is L or U.

The number is a prime number between 20 and 30 →

20
21
22
23
24
25

26
27
28
29
30

Write down all the possibilities for Lucy's code.

	23	29
L	L23	L29
U	U23	U29

✓₁ ✓₂

(Total for Question 12 is 2 marks)

13 A machine fills bags with sweets.

There are 4275 sweets.

There are 28 sweets in each full bag.

The machine fills as many bags as possible.

How many sweets are left?

1/ find number of full bags: $\frac{4275}{28} = 152.07\dots$
↳ ignore.

∴ 152 full bags ✓₁

2/ find number of sweets in 152 full bags:

$152 \times 28 = 4256$ ✓₂

3/ number of sweets left = $4275 - 4256$
 $= 19$

19 ✓₃

(Total for Question 13 is 3 marks)



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14 The table gives information about the number of goals scored by each of three teams.

Total = 120

Team	Number of goals
City	50
Rovers	45
United	25

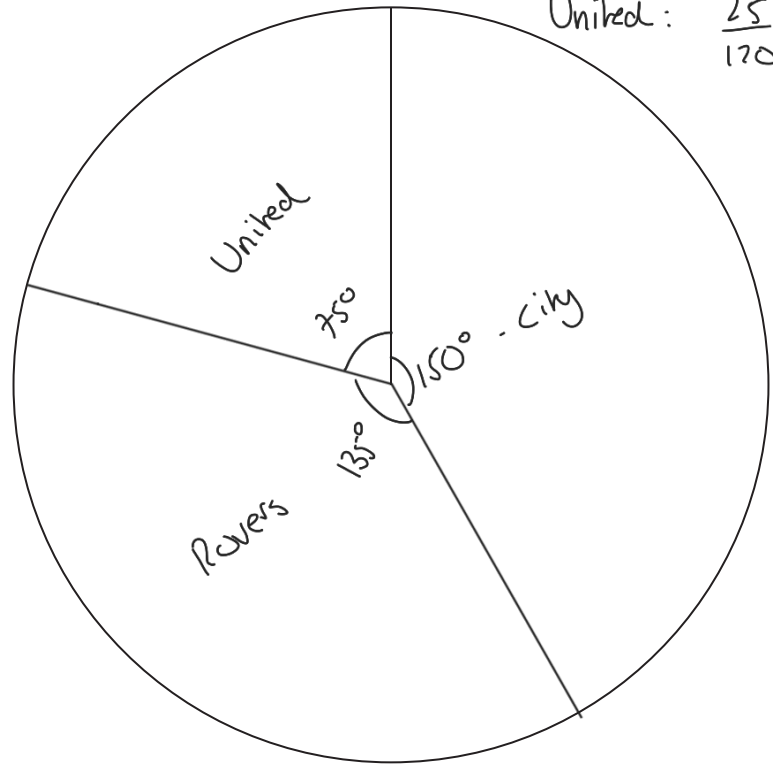
$$\text{angle } x = \frac{\text{num}x}{\text{total}} \times 360^\circ$$

Draw an accurate pie chart for this information.

$$\text{City: } \frac{50}{120} \times 360^\circ = 150^\circ \quad \checkmark_1$$

$$\text{Rovers: } \frac{45}{120} \times 360^\circ = 135^\circ \quad \checkmark_2$$

$$\text{United: } \frac{25}{120} \times 360^\circ = 75^\circ \quad \checkmark_3$$



(Total for Question 14 is 3 marks)



15 $T = 3x + 4y$

(a) Work out the value of T when $x = 5$ and $y = -7$

$$\begin{aligned} T &= 3(5) + 4(-7) \checkmark_1 \\ &= 15 - 28 \\ &= -13 \end{aligned}$$

$$\begin{array}{r} -13 \checkmark_2 \\ \hline (2) \end{array}$$

(b) Work out the value of y when $T = 38$ and $x = 6$

$$\begin{aligned} T &= 3x + 4y \\ 38 &= 3(6) + 4y \\ 38 &= 18 + 4y \checkmark_1 \\ -18 \downarrow & \quad \downarrow -18 \\ 20 &= 4y \downarrow \div 4 \\ \div 4 \downarrow & \quad \downarrow \div 4 \\ y &= \frac{20}{4} = 5 \end{aligned}$$

$$\begin{array}{r} 5 \checkmark_2 \\ \hline (2) \end{array}$$

(Total for Question 15 is 4 marks)



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16 An exam has two papers, Paper 1 and Paper 2

Paper 1 has 60 marks.

Paper 2 has 90 marks.

The pass mark is $\frac{2}{3}$ of the total number of marks. $Pm = \frac{2}{3} (60 + 90) = \frac{2}{3} \times 150$

Danielle gets 70% of the marks for Paper 1 = 100 ✓₁

How many of the marks for Paper 2 must Danielle get in order to get the pass mark?

Paper 1 mark : 70% of 60

$$0.7 \times 60 = 42 \text{ marks } \checkmark_2$$

$$\text{Mark needed on paper 2} = 100 - 42 = 58 \text{ marks. } \checkmark_3$$

58 marks ✓₄

(Total for Question 16 is 4 marks)



- 17 Scott wants to **make orange juice**.
He is going to **buy boxes of oranges**.

There are **24 oranges in each box of oranges**.

30 oranges make 2 litres of orange juice.

Scott needs to buy enough oranges to make **8 litres of orange juice**. $\rightarrow 120$ oranges

- (a) **Work out the number of boxes of oranges** that Scott **needs to buy**.
You must show all your working.

$$\begin{array}{l}
 \text{L of OJ} : 0 \\
 \times 4 \downarrow \quad 2 : 30 \\
 \quad \quad \quad 8 : 120 \quad \downarrow \times 4 \\
 \\
 \times 5 \downarrow \quad 1 \text{ box} \rightarrow 24 \text{ Oran} \\
 \quad \quad \quad 5 \text{ boxes} \quad 120 \quad \downarrow \times ? \rightarrow \frac{120}{24} = 5
 \end{array}$$

5 boxes ^{✓₃}
(3)

Scott also buys

1260 apples

280 bananas

- (b) **Write down the ratio** of the **number of apples that Scott buys to the number of bananas that he buys**.
Give your ratio in its simplest form.

apples : bananas

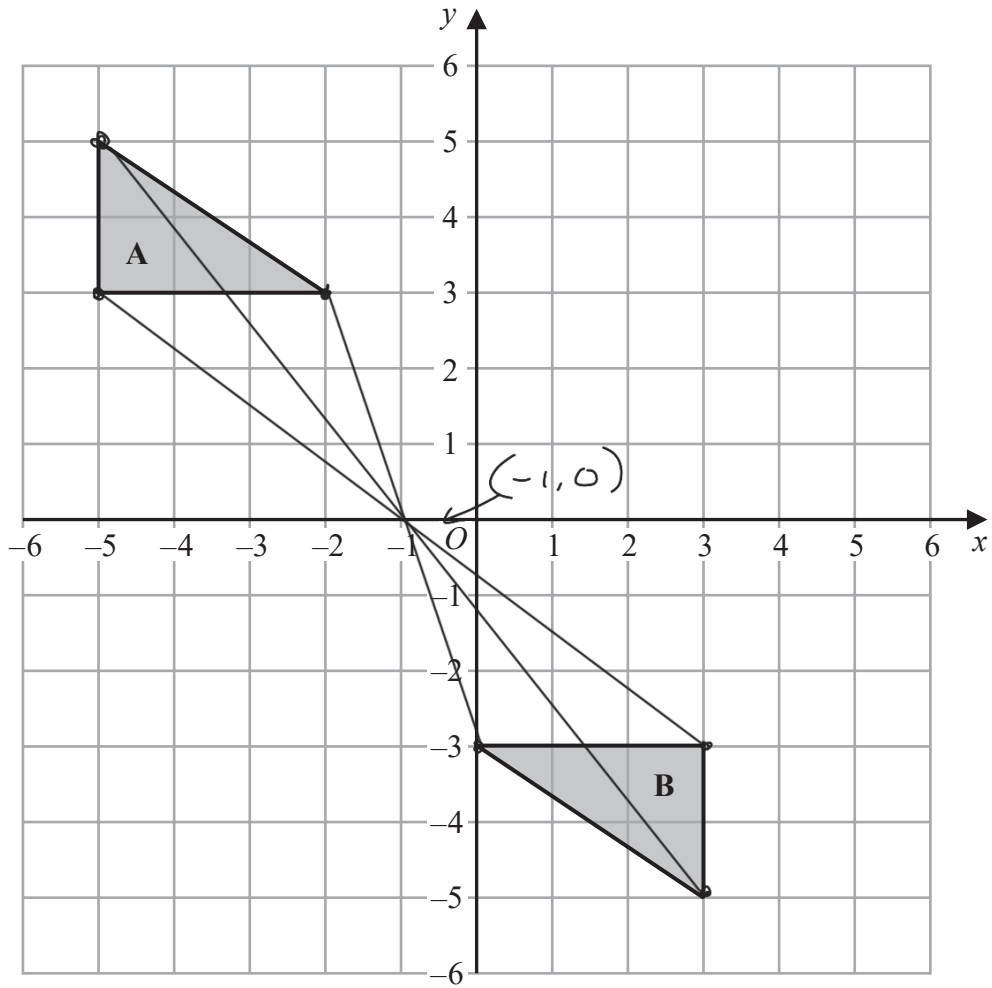
1260 : 280

9 : 2

9:2 ^{✓₁ ✓₂}
(2)

(Total for Question 17 is 5 marks)





Describe fully the single transformation that maps triangle A onto triangle B.

Rotation of 180° about the point $(-1, 0)$

(Total for Question 18 is 2 marks)



19 Adam, Linda and Rytis share an amount of money.

Linda gets three times as much money as Rytis gets. $\rightarrow L = 3R$

Linda gets half as much money as Adam gets. $\rightarrow L = \frac{1}{2}A$

What fraction of the amount of money does Linda get?

$$\begin{aligned} \text{Let } R = 1 &\rightarrow L = 3 && \text{ratio } A : L : R \\ &\rightarrow A = 6 && 6 : 3 : 1 \checkmark \end{aligned}$$

$$\text{fraction for Linda} = \frac{3}{6+3+1} = \frac{3}{10}$$

$$3/10 \checkmark^2$$

(Total for Question 19 is 2 marks)

20 Pens and pencils are sold in a shop.

12 pencils cost £1.80

The ratio of the cost of a pen to the cost of a pencil is 7:3

Work out the cost of 5 pens.

$$12 \text{ pencils} \rightarrow \pounds 1.80$$

$$1 \text{ pencil} \rightarrow \frac{\pounds 1.80}{12} = \pounds 0.15 \checkmark$$

Pen : Pencil

$$\begin{aligned} &7 : 3 \\ \times 0.05 \downarrow & \pounds 0.35 : \pounds 0.15 \downarrow \times ? \rightarrow ? = \frac{0.15}{3} = 0.05 \checkmark^2 \end{aligned}$$

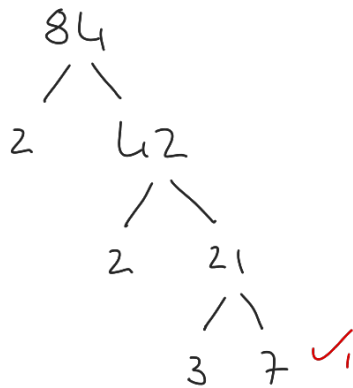
$$\begin{aligned} 5 \text{ pens} &= 5 \times \pounds 0.35 \\ &= \pounds 1.75 \end{aligned}$$

$$\pounds 1.75 \checkmark^4$$

(Total for Question 20 is 4 marks)



21 (a) Write 84 as a product of its prime factors.

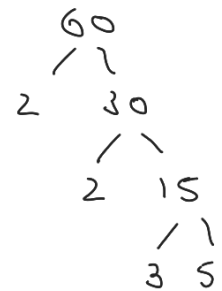


$$\frac{2 \times 2 \times 3 \times 7 \quad \checkmark}{(2)}$$

(b) Find the lowest common multiple (LCM) of 60 and 84

$$\begin{array}{l}
 84 = 2 \times 2 \times 3 \times 7 \\
 60 = 2 \times 2 \times 3 \times 5 \quad \checkmark
 \end{array}$$

$$\begin{aligned}
 \text{LCM}(60, 84) &= 2 \times 2 \times 3 \times 5 \times 7 \\
 &= 12 \times 5 \times 7 \\
 &= 60 \times 7 \\
 &= 420
 \end{aligned}$$



$$\frac{420 \quad \checkmark}{(2)}$$

(Total for Question 21 is 4 marks)

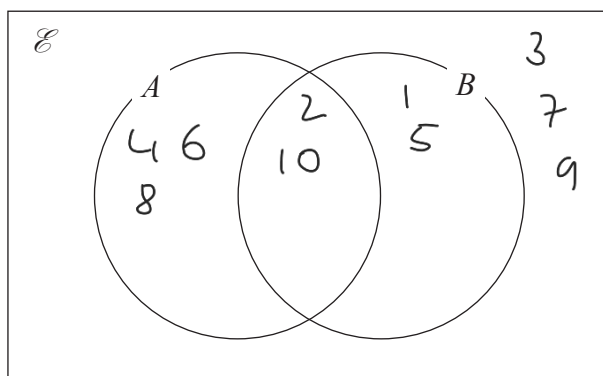


22 $\mathcal{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

$A = \{\text{even numbers}\}$

$B = \{\text{factors of } 10\}$

(a) Complete the Venn diagram for this information.



$\checkmark_1 \checkmark_2 \checkmark_3$

(3)

A number is chosen at random from the universal set, \mathcal{E}

(b) Find the probability that this number is in the set $A \cap B$

$$\frac{2}{10} \checkmark_1 \checkmark_2$$

(2)

(Total for Question 22 is 5 marks)



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23 Carlo puts tins into small boxes and into large boxes.

He puts 6 tins into each small box. \rightarrow Num small box = $\frac{1200}{6} = 200$

He puts 20 tins into each large box. \rightarrow Num large box = $\frac{1800}{20} = 90$ ✓₃

Carlo puts a total of 3000 tins into the boxes so that

number of tins in small boxes : number of tins in large boxes = 2:3

Carlo says that less than 30% of the boxes filled with tins are large boxes.

Is Carlo correct?

You must show all your working.

$$\text{1 share} = \frac{3000}{2+3} = 600 \checkmark_1$$

Small : large

$$2 : 3$$

$$1200 : 1800 \checkmark_2$$

finding number of large boxes as a proportion of number of total boxes.

$$= \frac{90}{200+90} = 0.3103... \rightarrow 31\% \text{ (2.s.f.)} \checkmark_4$$

31% > 30% \therefore Carlo is wrong. ✓₅

(Total for Question 23 is 5 marks)

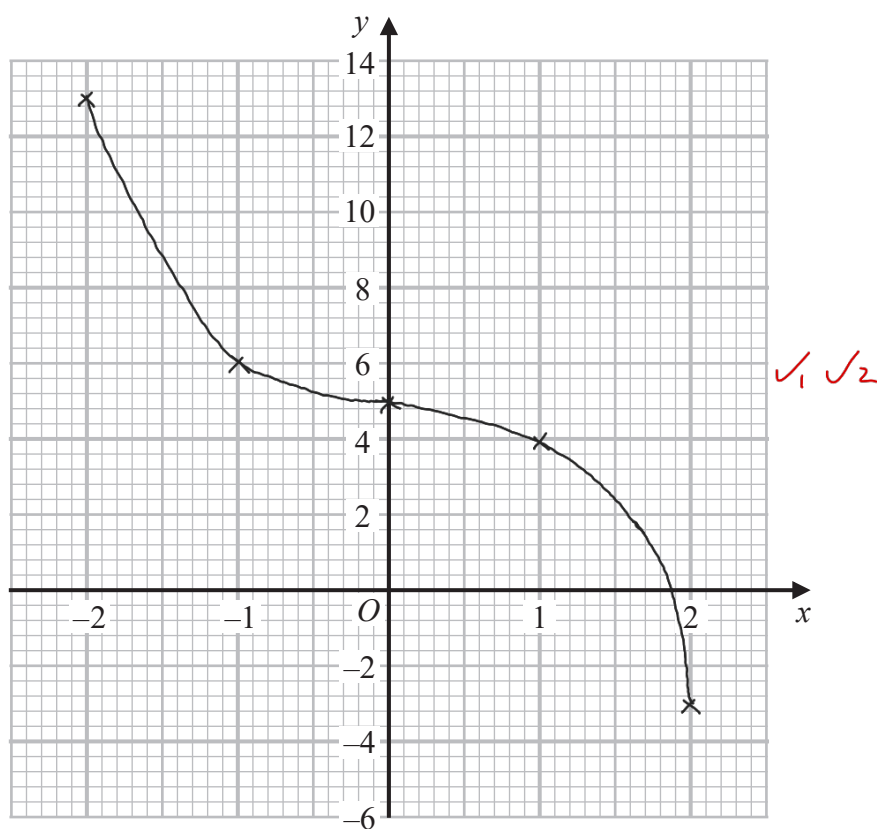


24 (a) Complete the table of values for $y = 5 - x^3$

	$5 - (-2)^3$	$5 - (-1)^3$	$5 - (0)^3$	$5 - (1)^3$	$5 - (2)^3$	
	↓	↓	↓	↓	↓	
x	-2	-1	0	1	2	
y	13	6	5	4	-3	✓1 ✓2

(2)

(b) On the grid below, draw the graph of $y = 5 - x^3$ for values of x from -2 to 2

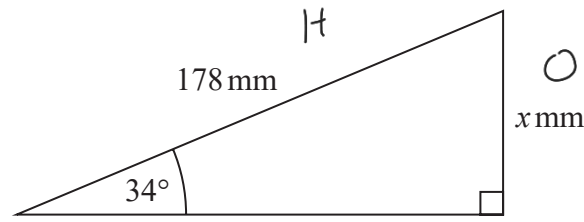


(2)

(Total for Question 24 is 4 marks)



25



SOH
CAH
TOA

Work out the value of x .

Give your answer correct to 1 decimal place.

$$\begin{aligned} \sin \theta &= \frac{O}{H} \rightarrow O = H \times \sin \theta \quad \checkmark_1 \\ &= 178 \text{ mm} \times \sin 34^\circ \\ &= 99.536\dots \text{ mm} \\ &= 99.5 \text{ mm} \end{aligned}$$

99.5 mm \checkmark_2

(Total for Question 25 is 2 marks)

26 $a = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$ $b = \begin{pmatrix} 5 \\ -2 \end{pmatrix}$

Find $2a - 3b$ as a column vector.

$$\begin{pmatrix} a \\ b \end{pmatrix} + \begin{pmatrix} c \\ d \end{pmatrix} = \begin{pmatrix} a+c \\ b+d \end{pmatrix}$$

$$k \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} kx \\ ky \end{pmatrix}$$

$$2 \begin{pmatrix} 3 \\ 4 \end{pmatrix} - 3 \begin{pmatrix} 5 \\ -2 \end{pmatrix}$$

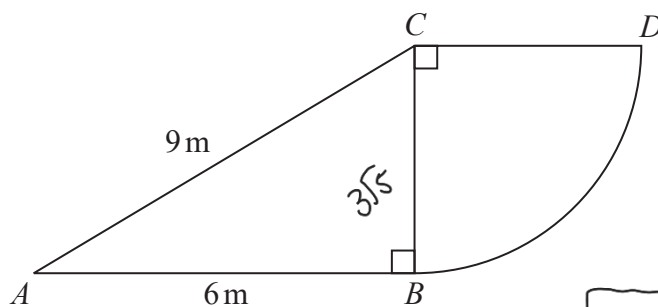
$$\begin{pmatrix} 6 \\ 8 \end{pmatrix} - \begin{pmatrix} 15 \\ -6 \end{pmatrix} = \begin{pmatrix} -9 \\ 14 \end{pmatrix} \quad \checkmark_1 \checkmark_2$$

$$\begin{pmatrix} -9 \\ \dots \\ 14 \end{pmatrix}$$

(Total for Question 26 is 2 marks)



27 The diagram shows a right-angled triangle and a quarter circle.



$$a^2 + b^2 = c^2$$

$$b^2 = c^2 - a^2$$

$$b = \sqrt{c^2 - a^2}$$

The right-angled triangle ABC has angle $ABC = 90^\circ$
 The quarter circle has centre C and radius CB .

Work out the area of the quarter circle.
 Give your answer correct to 3 significant figures.
 You must show all your working.

$$CB = \sqrt{9^2 - 6^2} \checkmark_1$$

$$= \sqrt{81 - 36} = \sqrt{45}$$

$$= 3\sqrt{5} \checkmark_2$$

$$\text{area of circle} = \pi r^2$$

$$\text{quarter of circle} = \frac{1}{4} \times \pi \times r^2$$

$$= \frac{1}{4} \times \pi \times (3\sqrt{5})^2 \checkmark_3 = 35.342\dots$$

$$= 35.3 \checkmark_4$$

..... 35.3 m^2

(Total for Question 27 is 4 marks)

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28 Each exterior angle of a regular polygon is 15°

Work out the number of sides of the polygon.

$$\frac{360^\circ}{n} = \text{Size of exterior angle } (\theta) \rightarrow \frac{360^\circ}{n} = \theta^\circ$$

$$360^\circ = n \theta^\circ$$

$$n = \frac{360^\circ}{15^\circ} = 24$$

$$n = \frac{360^\circ}{\theta^\circ}$$

..... 24 ✓

(Total for Question 28 is 2 marks)

29 Write down the gradient of the line with equation $y = 2x + 3$

$$y = mx + c$$

..... 2 ✓

(Total for Question 29 is 1 mark)

TOTAL FOR PAPER IS 80 MARKS



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