

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 4 June 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  $\pi$  button, take the value of  $\pi$  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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**.CG Maths.**  
Worked Solutions



Pearson

Please note that these worked solutions have neither been provided nor approved by Pearson Education and may not necessarily constitute the only possible solutions. Please refer to the original mark schemes for full guidance.

Any writing in blue should be written in the exam.

Anything written in green in a rectangle doesn't have to be written in the exam.

If you find any mistakes or have any requests or suggestions, please send an email to [curtis@cgmaths.co.uk](mailto:curtis@cgmaths.co.uk)

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.

Type into the calculator

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

(Total for Question 1 is 1 mark)

2 Write 29381 correct to the nearest 1000

The 9 is in the thousands place. The 3 after causes it to round down then everything after it is set to 0

$$29000$$

(Total for Question 2 is 1 mark)

3 Simplify  $3e - e + 4e$

$3 - 1 + 4 = 6$  so  $3e - e + 4e = 6e$

$$6e$$

(Total for Question 3 is 1 mark)

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

Multiplying a fraction by 100 converts it to a percentage.  $\frac{1}{4} \times 100 = 25$

$$25\%$$

(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

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

$3^3 = 3 \times 3 \times 3 = 27$

27

(Total for Question 5 is 1 mark)

6 Liz is watching a film at the cinema.

The film started at 1430

The film is 105 minutes long.

When the film ends, Liz takes 20 minutes to get to the bus stop.

A bus leaves the bus stop at 1645

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

You must show all your working.

$14^{\circ}30^{\circ} + 0^{\circ}105^{\circ} + 0^{\circ}20^{\circ}$

Adding the 105 minutes and 20 minutes to 14 30 by entering the times as sexagesimals on the calculator

16 35

$16^{\circ}35'0''$  can be read as 16 35

Yes

16 35 is before 16 45 so Liz does get to the bus stop in time

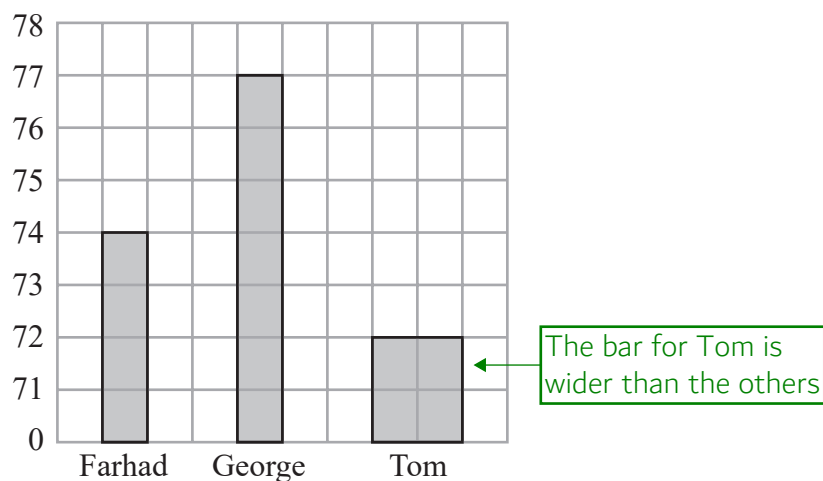
(Total for Question 6 is 3 marks)

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.

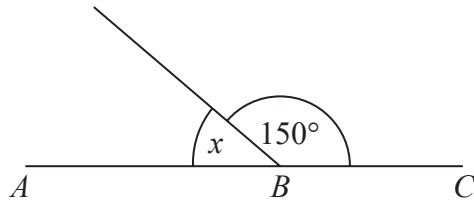
1 The bars are not all the same width

2 The scale goes from 0 to 71

The scale should be linear, meaning that it goes up by the same amount for each division

(Total for Question 7 is 2 marks)

8



ABC is a straight line.

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

180 - 150

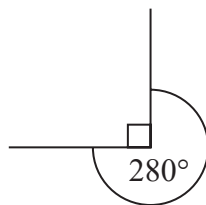
30 °  
.....  
(1)

(ii) Give a reason for your answer.

Angles around a point on a straight line add up to 180°

(1)

The diagram below is wrong.



(b) Explain why.

90 + 280 = 370

Angles around a point add up to 360°

(1)

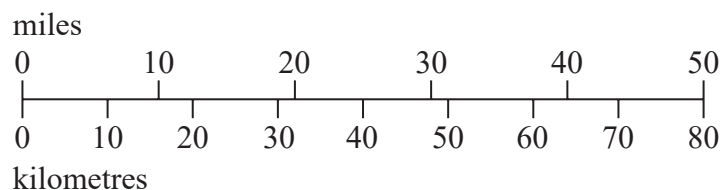
(Total for Question 8 is 3 marks)

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



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

The 40km is about halfway between 20 and 30 miles

..... 25 ..... 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.

$40 \div 10$  ← Dividing the distance in kilometres by 10 gives 4

$4 \times 6$  ← Then multiplying by 6 gives 24

..... 24 ..... miles  
(2)

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

They are close

24 miles is quite close to 25 miles

(1)

(Total for Question 9 is 4 marks)

10 (a) Solve  $3m = 36$

Dividing both sides by 3 eliminates the 3 on the left and gets m on its own

$$m = \frac{12}{(1)}$$

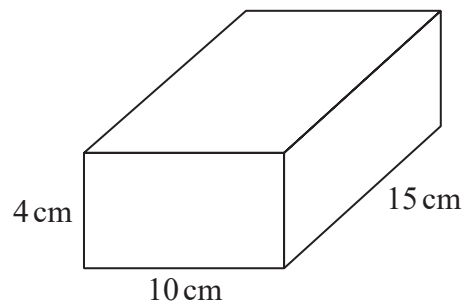
(b) Solve  $7 - x = 3$

4 must be subtracted from 7 to get 3

$$x = \frac{4}{(1)}$$

(Total for Question 10 is 2 marks)

11 Here is a cuboid.



Work out the volume of the cuboid.

$$4 \times 10 \times 15 \leftarrow \text{Volume of cuboid} = \text{length} \times \text{width} \times \text{height}$$

$\text{cm} \times \text{cm} \times \text{cm} = \text{cm}^3$ , so this is the unit of volume

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

(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

Write down all the possibilities for Lucy's code.

The only primes between 20 and 30 are 23 and 29. The calculator can be used to check if a number is prime by formatting it as a product of prime factors. If it does not change it must be prime

L23, L29, U23, U29 ← Systematically listing the possibilities

(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?

$4275 \div 28$  ← Dividing the 4275 sweets by the 28 sweets in each bag works out that 152 bags are filled

$152 \times 28$  ← Multiplying the 152 bags by the 28 sweets in each bag works out that there are 4256 sweets in 152 bags

$4275 - 4256$  ← Subtracting the 4256 sweets in the bags from the 4275 sweets works out that there are 19 sweets left

19

(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.

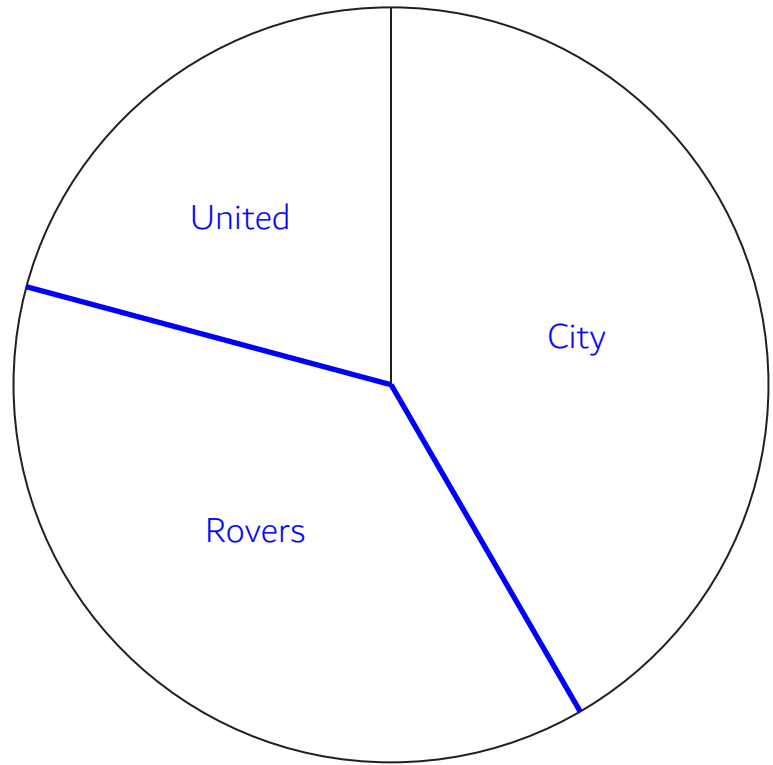
Team	Number of goals	
City	50	$\times 3 = 150$
Rovers	45	$\times 3 = 135$
United	25	$\times 3 = 75$

Draw an accurate pie chart for this information.

Multiplying the numbers of goals by the 3° which represent each goal works out the angles

$$\frac{360}{50+45+25} = 3$$

There are 360° in total in a pie chart. Dividing this by the total number of goals works out that 3° represent each goal



Drawing on the angles using a protractor

(Total for Question 14 is 3 marks)

15  $T = 3x + 4y$

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

$3 \times 5 + 4 \times -7$  ← Substituting 5 for  $x$  and  $-7$  for  $y$  in the right side of the formula finds  $T$

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

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

$38 = 3(6) + 4y$  ← Substituting 38 for  $T$  and 6 for  $x$  in the formula

$20 = 4y$  ← Subtracting  $3(6)$  from both sides gets the  $y$  term on its own

Dividing both sides by 4 gets  $y$  on its own

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

(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.

Danielle gets 70% of the marks for Paper 1

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

$$60 + 90$$

Adding the 60 marks for Paper 1 and the 90 marks for Paper 2 works out that there are 150 marks in total

$$\frac{2}{3} \times 150 = 100$$

Doing  $\frac{2}{3}$  of the 150 total marks finds that the pass mark is 100

$$\frac{70}{100} \times 60$$

Putting 70% over 100 converts it to a fraction. Multiplying this by 60 finds that 70% of the 60 marks for Paper 1 is 42 marks

$$100 - 42$$

Subtracting the 42 marks achieved on Paper 1 from the 100 pass mark works out that 58 marks are needed on Paper 2 to get the pass mark

.....58

(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.

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

$8 \div 2$  ← Dividing the 8 litres by the 2 litres works out that 4 lots of the 30 oranges are needed

$30 \times 4$  ← Multiplying the 30 oranges by 4 works out that 120 oranges are needed

$120 \div 24$  ← Dividing the 120 oranges by the 24 oranges in each box works out that 5 boxes are needed

5  
.....  
(3)

Scott also buys  
1260 apples  
280 bananas

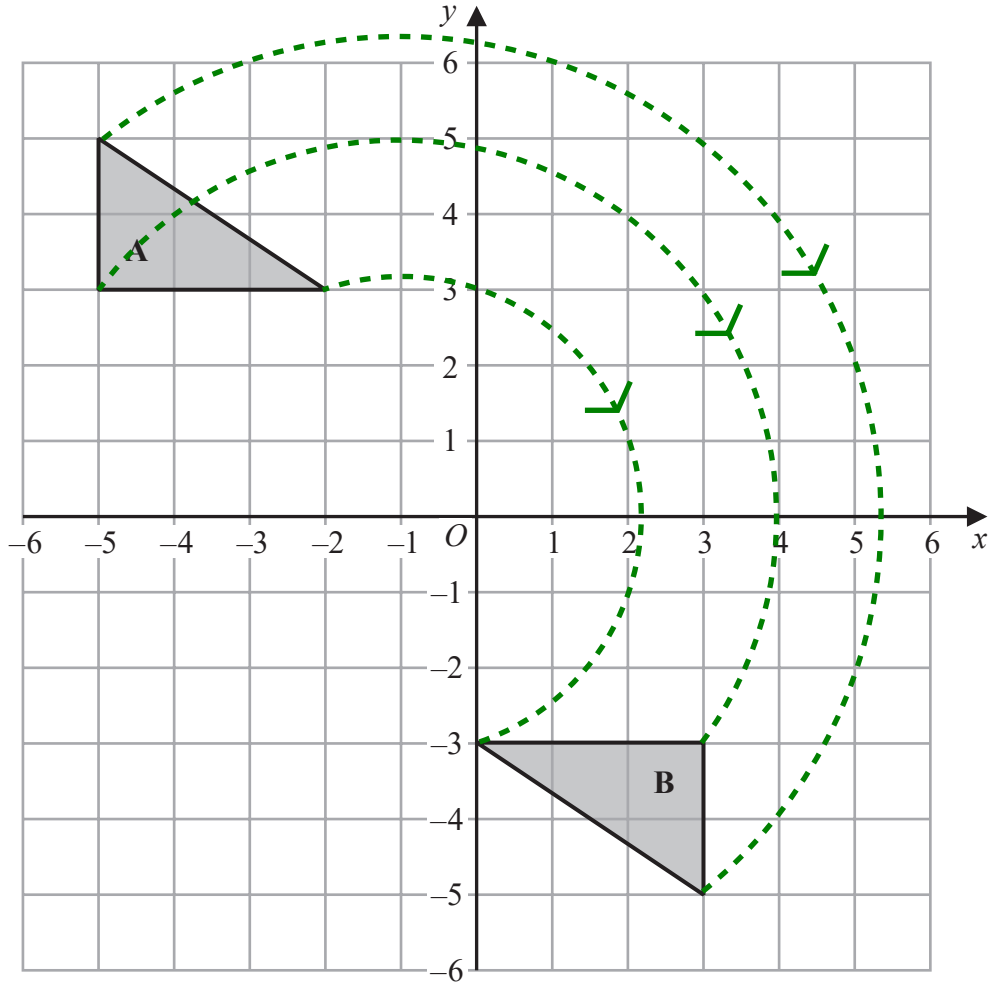
- (b) Write down the ratio of the number of apples that Scott buys to the number of bananas that he buys.  
Give your ratio in its simplest form.

$1260 : 280$  ← Writing the ratio of the number of apples to the number of bananas

Ratios simplify in a similar way to fractions. Entering the fraction  $1260/280$  into the calculator simplifies it to  $9/2$ , so the ratio must simplify to  $9 : 2$

9 : 2  
.....  
(2)

(Total for Question 17 is 5 marks)



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

Rotation  $180^\circ$  about  $(-1, 0)$

To work out where it is rotating around, consider the circular motion. The point must be roughly in the centre of the circles. Use tracing paper to rotate A around various different points until the one which works to rotate and get B is found

(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.

Linda gets half as much money as Adam gets.

What fraction of the amount of money does Linda get?

6:3:1

This is the ratio of money for Adam : Linda : Rytis. Setting Rytis to 1 part. Linda gets three times as much as Rytis so gets 3 parts. Linda gets half what Adam gets so Adam must get twice as much as Linda so gets 6 parts

6 + 3 + 1 = 10 parts in total. Linda gets 3 out of these

$\frac{3}{10}$

(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.

1.80 ÷ 12 ← Dividing the £1.80 by the 12 pencils finds that the cost of a pencil is £0.15

0.15 ÷ 3 ← Dividing the £0.15 cost of a pencil by the 3 parts of the ratio which represent it finds that 1 part of the ratio is worth £0.05

0.05 × 7 ← Multiplying the value of 1 part of the ratio by the 7 parts finds that the cost of a pen is £0.35

0.35 × 5 ← Multiplying the cost of a pen by the 5 pens finds that 5 pens cost £1.75

£..... 1.75

(Total for Question 20 is 4 marks)

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

The calculator can be used to format 84 as a product of its prime factors

$$\frac{2^2 \times 3 \times 7}{(2)}$$

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

$$2^2 \times 3 \times 5$$

Using the calculator to format 60 as a product of its prime factors

$$2^2 \times 3 \times 5 \times 7$$

Both 60 and 84 are expressed as a product of prime factors in index form. The LCM is the highest power of each prime multiplied together

Newer Casio calculators can find the LCM of two numbers without having to do this method

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

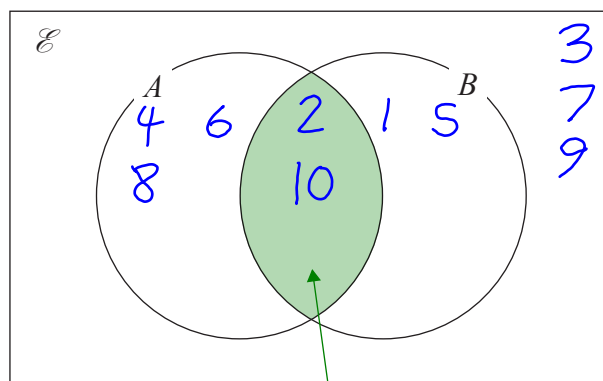
(Total for Question 21 is 4 marks)

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.



The intersection of A and B

(3)

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

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

2 out of the 10 numbers are in the intersection of A and B

$$\frac{2}{10}$$

(2)

(Total for Question 22 is 5 marks)

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

He puts 6 tins into each small box.

He puts 20 tins into each large box.

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

$$\text{number of tins in small boxes} : \text{number of tins in large boxes} = 2:3$$

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

Is Carlo correct?

You must show all your working.

$$3000 \div 5$$

2 + 3 = 5 parts in total in the ratio. Dividing the 3000 tins by these 5 parts finds that 1 part of the ratio is worth 600 tins

$$600 \times 2 = 1200$$

Multiplying the value of 1 part of the ratio by 2 finds that there are 1200 tins in small boxes

$$600 \times 3 = 1800$$

Multiplying the value of 1 part of the ratio by 3 finds that there are 1800 tins in large boxes

$$1200 \div 6 = 200$$

Dividing the 1200 tins in small boxes by the 6 tins in each small box finds that there are 200 small boxes

$$1800 \div 20 = 90$$

Dividing the 1800 tins in large boxes by the 20 tins in each large box finds that there are 90 large boxes

$$200 + 90$$

Adding the 200 small boxes and the 90 large boxes finds that there are 290 boxes in total

$$\frac{30}{100} \times 290 = 87$$

Putting the 30% over 100 converts it to a fraction. Doing this fraction of the 290 boxes finds that 30% of the boxes is 87 boxes

No

More than 30% of the boxes filled with tins are large boxes as there are 90 large boxes and this is more than the 87 boxes which are 30% of the boxes

(Total for Question 23 is 5 marks)

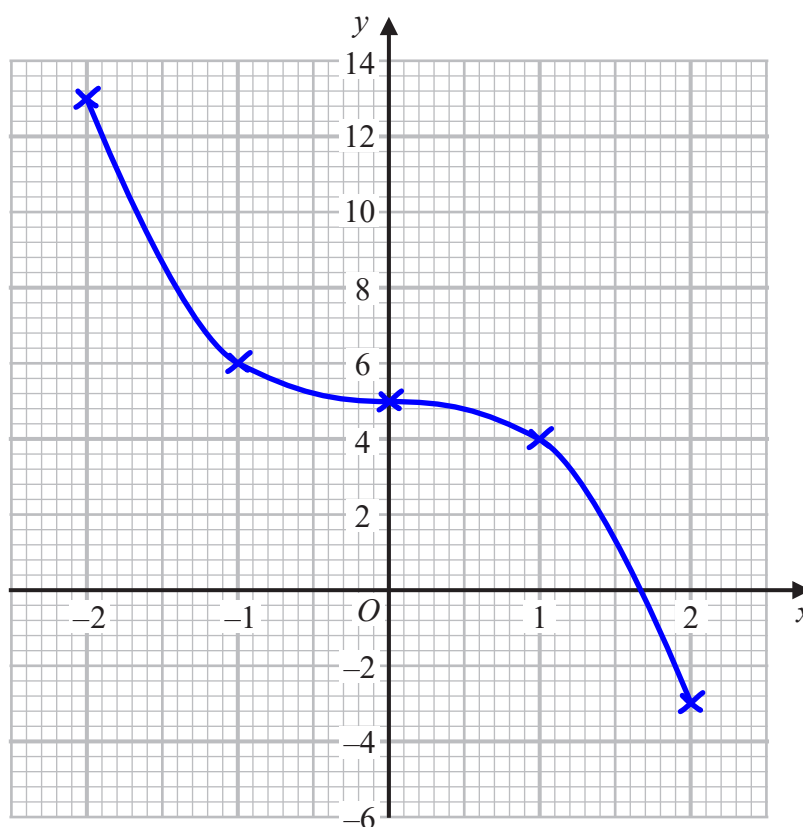
24 (a) Complete the table of values for  $y = 5 - x^3$

Using table mode on the calculator. Define  $f(x) = 5 - x^3$ . Start: -2. End: 2. Step: 1

$x$	-2	-1	0	1	2
$y$	13	6	5	4	-3

(2)

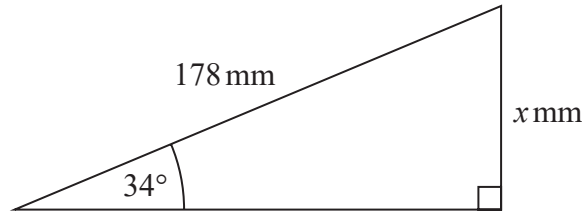
(b) On the grid below, draw the graph of  $y = 5 - x^3$  for values of  $x$  from -2 to 2



Plotting the points from the table of values then joining them up with a curve (2)

(Total for Question 24 is 4 marks)

25



Work out the value of  $x$ .  
Give your answer correct to 1 decimal place.

SÓHCAHTOA

Using right-angled trigonometry. Ticking H as the 178 mm is the hypotenuse. Ticking O as  $x$  is the opposite. There are two ticks on the SOH formula triangle so this one can be used

$\sin 34 \times 178$

Covering O finds that opposite = sin of the angle  $\times$  hypotenuse

99.53... is rounded to 1 decimal place

99.5

(Total for Question 25 is 2 marks)

26  $a = \begin{pmatrix} 3 \\ 4 \end{pmatrix}$

$b = \begin{pmatrix} 5 \\ -2 \end{pmatrix}$  x-component  
y-component

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

$2(3) - 3(5)$

Doing 2 multiplied by the x-component of a add 3 multiplied by the x-component of b works out that the x component is -9

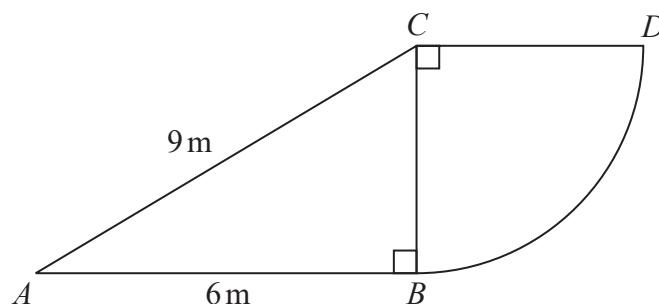
$2(4) - 3(-2)$

Doing 2 multiplied by the y-component of a add 3 multiplied by the y-component of b works out that the y component is 14

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

(Total for Question 26 is 2 marks)

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



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.

$$CB^2 + 6^2 = 9^2 \leftarrow \text{Pythagoras' Theorem can be used in the right-angled triangle } ABC. a^2 + b^2 = c^2, \text{ where } a \text{ and } b \text{ are the shorter sides and } c \text{ is the longest side}$$

$$CB^2 = 45 \leftarrow \text{Subtracting } 6^2 \text{ from both sides finds } CB^2$$

$$\pi \times 45 \leftarrow \text{CB is the radius of the quarter circle. Area of circle} = \pi \times \text{radius}^2. \text{ So the area of the whole circle is } 45\pi \text{ m}^2$$

$$45\pi \div 4 \leftarrow \text{Dividing the area of the whole circle by 4 works out the area of the quarter circle}$$

35.34... is rounded to 3 significant figures

..... 35.3 ..... m<sup>2</sup>

(Total for Question 27 is 4 marks)

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28 Each exterior angle of a regular polygon is  $15^\circ$

Work out the number of sides of the polygon.

$360 \div 15$

The exterior angles of any polygon add up to  $360^\circ$ . So dividing  $360^\circ$  by the  $15^\circ$  works out that there are 24 exterior angles. There are as many sides as exterior angles

.....  
24

(Total for Question 28 is 2 marks)

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

The general equation of a straight line is  $y = mx + c$ , where  $m$  is the gradient and  $c$  is the  $y$ -intercept. The equation is already in this form and  $m$  is 2

.....  
2

(Total for Question 29 is 1 mark)

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TOTAL FOR PAPER IS 80 MARKS