Please check the examination details below before entering your candidate information

Candidate surname	Other names

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

Centre Number | | | | | |

Candidate Number | | | | |

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 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

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 indicates what must be written in order to answer the questions and get the marks. The worked solutions have been designed to show the smallest amount of work which needs to be done to answer the question.

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

Anything written in orange in a rectangle doesn't have to be written in the exam and is there to show what should be put into a calculator or measured using a ruler or protractor.

If you find any mistakes or have any requests or suggestions, please send an email to curtis@cgmaths.co.uk

.CG Maths.

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 then press the SD button

37/100

(Total for Question 1 is 1 mark)

2 Write 29 381 correct to the nearest 1000

The 9 is in the thousands place. The 3 after causes it to round down and everything after it is ignored and 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.

1/4 is a common conversion so is one we could just know. But if not we can work out 1/4 of 100 as percent is out of 100

1/4 x 100 = 25

25 %

(Total for Question 4 is 1 mark)

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.

We could know the cube numbers up to 125, which is 5^3, as these are quite common. If we don't know them, we can go through them until we get to one on the list. $1^3 = 1$. $2^3 = 8$. $3^3 = 27$

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.

14:30 + 0:105 + 0:20 = 16:35

FACT B
o , ,,

To put time into the calculator, enter the hours then press the button on the left. Then enter the minutes and press the button on the left again. It should come out as: 14°30° + 0°105° + 0°20° = 16°35'0'', which is the answer returned in time in the format hours-minutes-seconds

Yes ← 16:45 is after 16:35

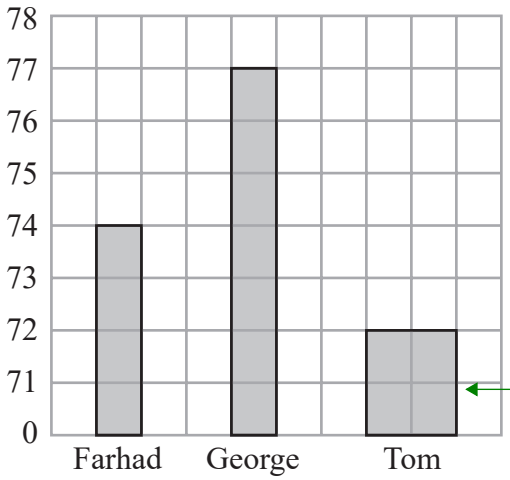
(Total for Question 6 is 3 marks)

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 on bar charts should start at 0 and go up regularly

(Total for Question 7 is 2 marks)

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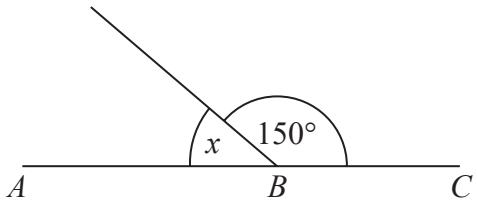
8



ABC is a straight line.

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

180 - 150 = 30

30 °

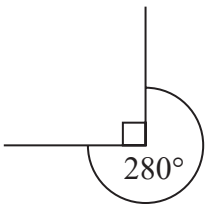
(1)

(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.

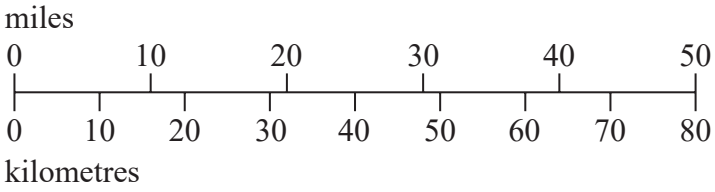
90 + 280 = 370

Angles around a point sum to 360

(1)

(Total for Question 8 is 3 marks)

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 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.

$\frac{40}{10} \times 6$

24 miles

(2)

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

They are close

(1)

(Total for Question 9 is 4 marks)

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10 (a) Solve $3m = 36$

Dividing both sides by 3 eliminates the 3 from the left

$m =$ 12

(1)

(b) Solve $7 - x = 3$

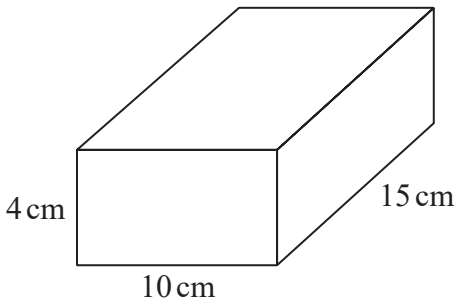
4 must be subtracted from 7 to get 3

$x =$ 4

(1)

(Total for Question 10 is 2 marks)

11 Here is a cuboid.



Work out the volume of the cuboid.

4 × 10 × 15 ← Volume of cuboid = length x width x height

cm x cm x cm = cm^3, so this is the unit

600 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

FACT B

To check if a number is prime: enter the number, press =, press SHIFT then the button on the left. If it comes back as itself, it is prime. If it comes back as other numbers multiplied together, it isn't 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?

$\frac{4275}{28} = 152\frac{19}{28}$

The mixed number tells us that there are 152 bags and 19 sweets left over. When using this method to work out a remainder, be careful that the denominator is what we were dividing by, 28

To convert to a mixed number: enter the fraction, press =, then press SHIFT and then the SD button

19

(Total for Question 13 is 3 marks)

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

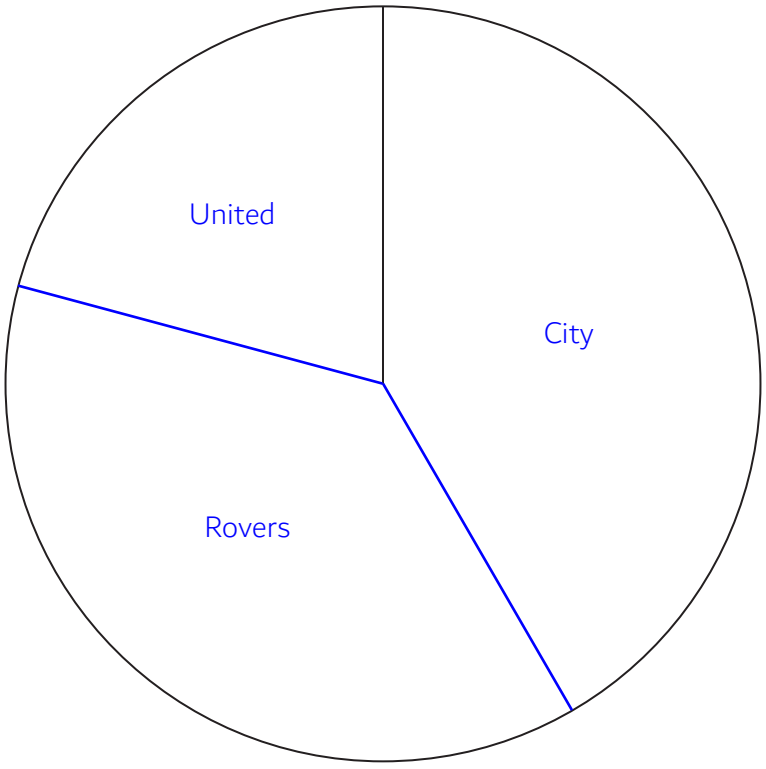
Team	Number of goals
City	50
Rovers	45
United	25

× 3 = 150
× 3 = 135
× 3 = 75
Angles

Draw an accurate pie chart for this information.

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

There are 360 degrees in total in a pie chart. Sharing this by the total number of goals works out that 3 degrees 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 x for 5 and y for -7

-13

(2)

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

$4y = T - 3x$ ← Subtracting 3x from both sides to get the y term by itself

$y = \frac{38 - 3 \times 6}{4}$ ← Dividing both sides by 4 to get y on its own and substituting T for 38 and x for 6

5

(2)

(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?

$\frac{2}{3} \times (60 + 90) - 0.7 \times 60$

2/3 of the total number of marks

70% of the marks for Paper 1

Subtracting the number of marks she got on Paper 1 from the pass mark gives the number of marks she must get on Paper 2

58

(Total for Question 16 is 4 marks)

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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.

$\frac{8}{2} \times 30$

24

Dividing 8 by 2 works out how many lots of 2 litres go into the 8 litres and therefore how many lots of 30 oranges are needed. Multiplying this by 30 works out how many oranges are needed. Dividing this by 24 works out how many lots of 24 this is and therefore how many boxes of oranges 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.

$\frac{1280}{280} = \frac{9}{2}$

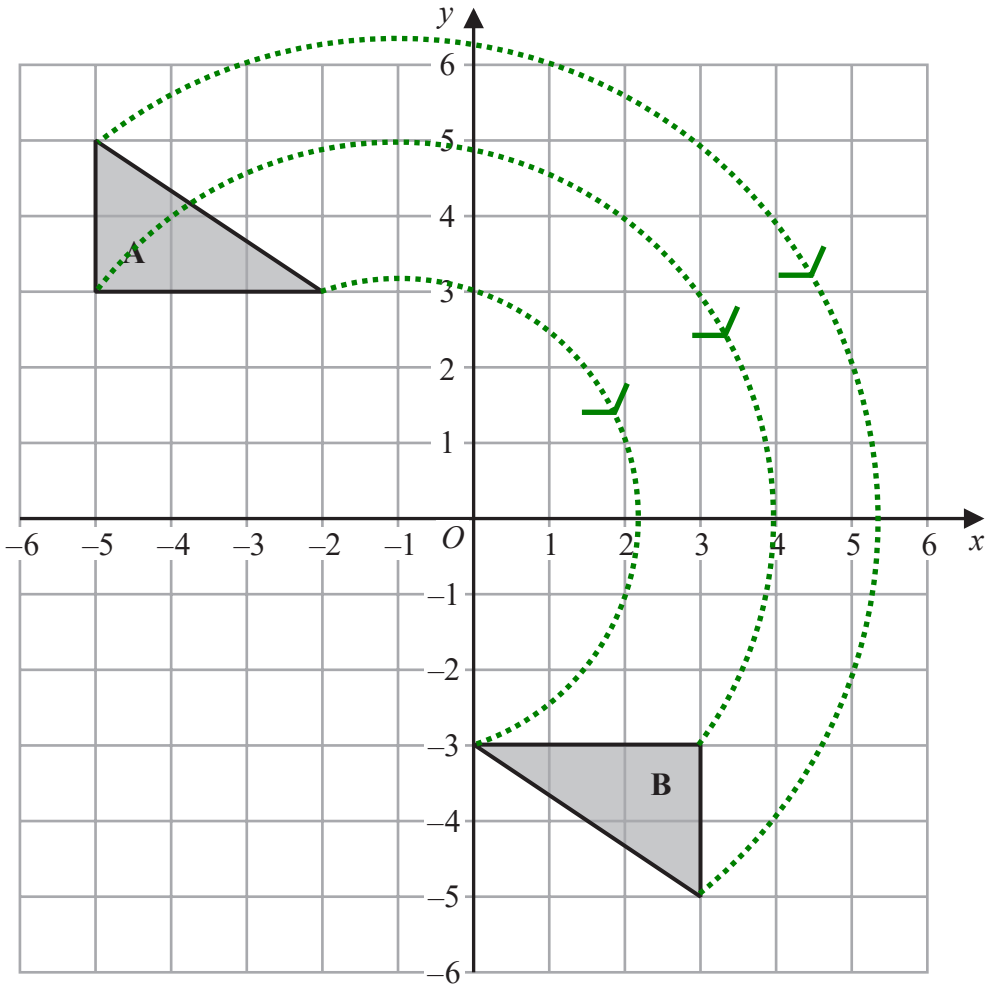
Fractions simplify in a similar way to ratios

9 : 2

(2)

(Total for Question 17 is 5 marks)

18



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

Rotation 180° 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. We can use tracing paper to rotate A around various different points until we find the one which works to rotate and get B

(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

Linda gets 3 parts out of a total of 10 parts. 6 + 3 + 1 = 10 → $\frac{3}{10}$

(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.

$\frac{\left(\frac{1.80}{12}\right)}{3} \times 7 \times 5$ ← Dividing the £1.80 by 12 works out the cost of 1 pencil. 3 parts of the ratio represent the cost of a pencil so dividing by 3 works out what 1 part represents. Multiplying this by 7 works out what 7 parts represent, which is the cost of a pen. Multiplying this by 5 as we need to find the cost of 5 pens

£ 1.75

(Total for Question 20 is 4 marks)

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

FACT B: Enter 84 in the calculator then press =. Then press SHIFT then the button on the left

$2^2 \times 3 \times 7$

(2)

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

$2^2 \times 3 \times 5$ ← FACT B: Enter 60 in the calculator then press =. Then press SHIFT then the button on the left

$2^2 \times 3 \times 5 \times 7$ ← 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

420

(2)

(Total for Question 21 is 4 marks)

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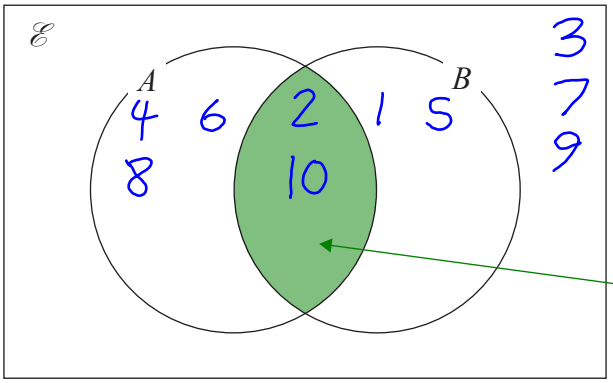
22 $\mathscr{E} = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$
$A = \{\text{even numbers}\}$
$B = \{\text{factors of } 10\}$

(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, $\mathscr{E}$

(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)

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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

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.

$\frac{\frac{3000}{5} \times 2}{6} = 200$

There are 5 parts in total in the ratio and these represent a total of 3000 tins. Dividing 3000 by 5 works out what 1 part represents. Multiplying this by 2 works out what 2 parts represent and therefore works out how many tins are in small boxes. Dividing this by 6 works out how many lots of 6 go into this and therefore how many boxes are filled with small tins

$\frac{\frac{3000}{5} \times 3}{20} = 90$

There are 5 parts in total in the ratio and these represent a total of 3000 tins. Dividing 3000 by 5 works out what 1 part represents. Multiplying this by 3 works out what 3 parts represent and therefore works out how many tins are in large boxes. Dividing this by 20 works out how many lots of 20 go into this and therefore how many boxes are filled with large tins

$\frac{90}{290} \times 100 = 31\%$

There are 290 boxes of tins in total as 200 + 90 = 290. Out of these, 90 are filled with large tins. Writing this as a fraction then multiplying by 100 converts it into a percentage

No

31% is not less than 30%

(Total for Question 23 is 5 marks)

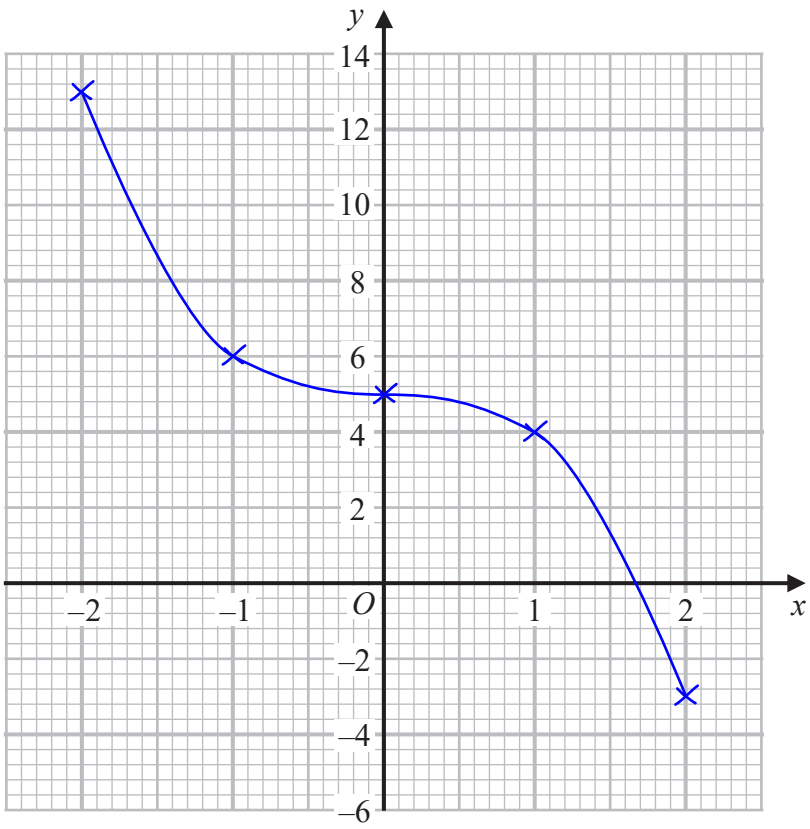
24 (a) Complete the table of values for $y = 5 - x^3$

Press MENU then 3 to enter table mode. Enter f(x) = 5 - x^3 then press =. Ignore g(x) by pressing =. Start: -2, End: 2, Step: 1. Enter the number and press = to set each of these

x	–2	–1	0	1	2
y	13	6	5	4	-3

(2)

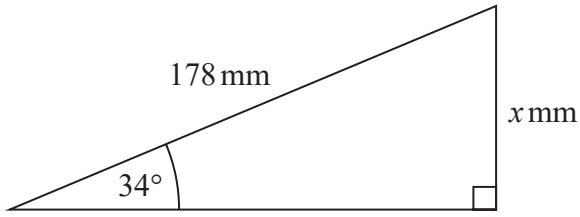
(b) On the grid below, draw the graph of $y = 5 - x^3$ for values of x from –2 to 2



(2)

(Total for Question 24 is 4 marks)

25



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

SOH CAH TOA

Writing SOH CAH TOA as formula triangles. Ticking O as we are finding the opposite and H as we have the hypotenuse. There are two ticks on SOH so we can use this formula triangle

Sin34 × 178

By covering O, what we are trying to find, the formula triangle tells us that the opposite, x, is equal to sin of the angle x hypotenuse

99.5

(Total for Question 25 is 2 marks)

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

Find $2\mathbf{a} - 3\mathbf{b}$ as a column vector.

$\begin{pmatrix} 6 \\ 8 \end{pmatrix} - \begin{pmatrix} 15 \\ -6 \end{pmatrix}$

Multiplying the x and y component by 3 in b gives this

Multiplying the x and y component by 2 in a gives this

Subtracting the x and y components separately.
6 - 15 = -9
8 - -6 = 14

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

(Total for Question 26 is 2 marks)

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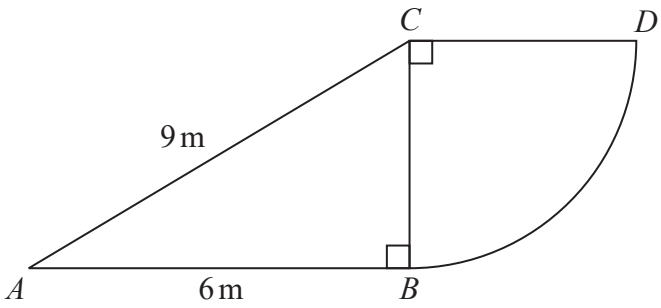
27 The diagram shows a right-angled triangle and a quarter circle.



The right-angled triangle ABC has angle $ABC = 90°$
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.

$a^2 + b^2 = c^2$ ← CB can be found using Pythagoras' Theorem. c is the longest side, a and b are the shorter sides

$a = \sqrt{c^2 - b^2}$ ← Rearranged to make a the subject by subtracting b^2 from both sides then square rooting both sides

$\frac{1}{4}\left(\pi \times \left(\sqrt{9^2 - 6^2}\right)^2\right)$ ← Area of circle = πr^2, where r is the radius. r is side CB, which is found by substituting in 9 for c and 6 for b in the rearranged Pythagoras' Theorem. Doing 1/4 of the area of the circle as it is a quarter circle

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.

$\frac{360}{15}$ ← The sum of the exterior angles for any polygon is 360. So dividing 360 by 15 works out how many lots of 15 there are and therefore how many exterior angles there are. 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)

TOTAL FOR PAPER IS 80 MARKS