AQA

.CG Maths.
Hints

Please write clearly in block capitals.

Centre number | | | | | | Candidate number | | | | |

Surname _____

Forename(s) _____

Candidate signature _____

GCSE MATHEMATICS

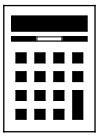
F

Foundation Tier Paper 2 Calculator

Thursday 8 June 2017 Morning Time allowed: 1 hour 30 minutes

Materials

For this paper you must have:
- a calculator
- mathematical instruments.



Instructions
- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information
- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer book.

Advice
- In all calculations, show clearly how you work out your answer.

For Examiner's Use	
Pages	Mark
2–3	
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16–17	
18–19	
20–21	
22–23	
24–25	
26	
TOTAL	

Please note that these worked solutions have neither been provided nor approved by AQA 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

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Answer **all** questions in the spaces provided

1 Which unit is most suitable for measuring the length of a tennis court?

Circle your answer.

[1 mark]

kilometres metres centimetres millimetres

Consider how long the unit is compared to a tennis court. We don't want a fraction or many thousands/millions of a unit.

2 Circle the multiple of both 8 and 12

[1 mark]

4 32 72 108

A number which is the result of multiplying 8 by a whole number and can also be got by multiplying 12 by a whole number. In both the 8 and 12 times tables.

3 What is $\frac{3}{2}$ as a decimal?

Circle your answer.

[1 mark]

1.05 1.1 1.5 3.2

Type into the calculator then press the SD button

4 Circle the correct statement.

[1 mark]

$-4 < -3$ $\quad 1 \leqslant -2$ $\quad -6 > 5$ $\quad -1 \geqslant 0$

The more negative a number is, the smaller it is.
The less positive a number is, the smaller it is

5 (a) Use your calculator to work out $\sqrt{701}$ as a decimal.

Write down your full calculator display.

[1 mark]

Answer 26.47...

Type into the calculator then press the SD button

5 (b) Give your answer to part (a) to 1 decimal place.

[1 mark]

Answer _____

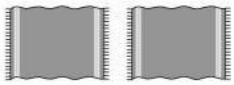
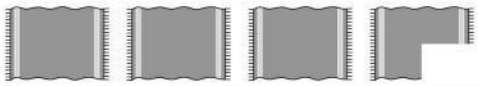
The 2nd decimal place is a 7 so does this means the 4 in the 1st place rounds up or down?

6

6 A swimming pool has three changing rooms, Male, Female and Family.

The pictogram shows the number of people using each changing room during one hour.

Key:  represents _____ people

Male	
Female	
Family	

8 people used the Male changing room.

6 (a) Complete the key.

[1 mark]

2 symbols represents 8

6 (b) How many people used the Female changing room?

[1 mark]

3 x 4 = 12
3/4 x 4 = 3

Answer _____

6 (c) The manager has bought lockers for the changing rooms.

Why should she **not** use these results to decide where to put them?

[1 mark]

'The pictogram shows the number of people using each changing room during one hour.'

7 Here is a list of numbers.

21 17 23 21 29 32 21 25 36

Work out the median.

[2 marks]

There are 9 values.
(n + 1)/2 = ?
So the ?th smallest value is the median.

Or rewrite the list in order then find the middle value.

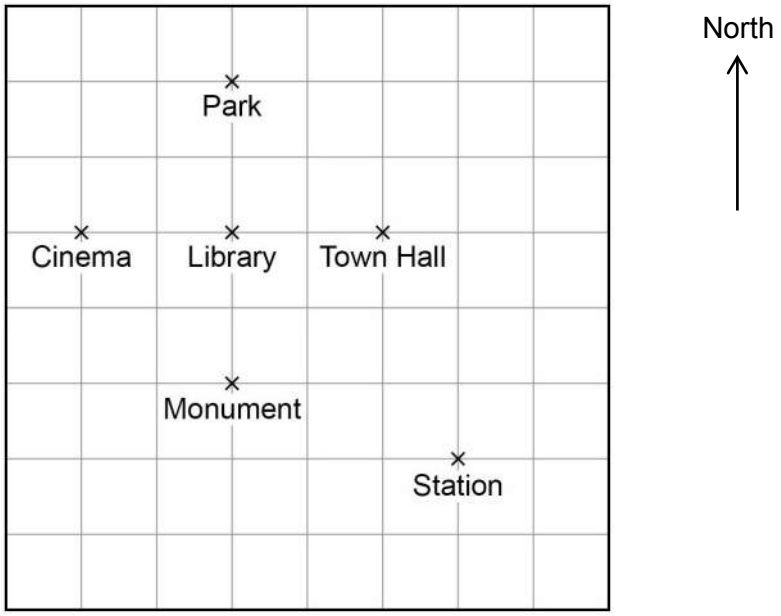
Answer _____

Turn over for the next question

5

8 Here is a map of a town.

Scale: 1 cm represents 200 m



8 (a) Which place is exactly North West of the Station?
Circle your answer.

North West

[1 mark]

Cinema Town Hall Library Park Monument

8 (b) Circle the three-figure bearing of the Monument from the Park.

[1 mark]

090° 180° 270° 360°

If you were at the Park facing north, you would have to turn ?° clockwise to face the Monument.

8 (c) What is the distance, in metres, from the Cinema to the Station?

[3 marks]

Every cm represents 200m so this works out ? lots of 200m. ?cm as measured on the diagram.

Answer _____ metres

8 (d) Why might the shortest **walking** distance from the Cinema to the Station be greater than your answer to part (c)?

[1 mark]

The distance measured was a straight line directly between the two points. Could you normally walk in a straight line between two places so far away?

Turn over for the next question

6

9 Complete the bank statement.

[2 marks]

Date	Description	Credit (£)	Debit (£)	Balance (£)
13/12/2016	Starting balance			212.48
14/12/2016	Council tax		128.39	
15/12/2016	Salary	856.21		

Credit means money put in. Debit is money taken out.

10 The average age of teachers at a school is 36 years.

Mr Smith's age is $\frac{11}{9}$ of the average.

How old is Mr Smith?

[2 marks]

'Of' means to multiply

Answer _____ years

11 Solve $4x - 3 = 14$

[2 marks]

Rearrange to make x the subject by doing the same to both sides. Follow BIDMAS backward to decide what to remove from the left side first.

$x =$ _____

Turn over for the next question

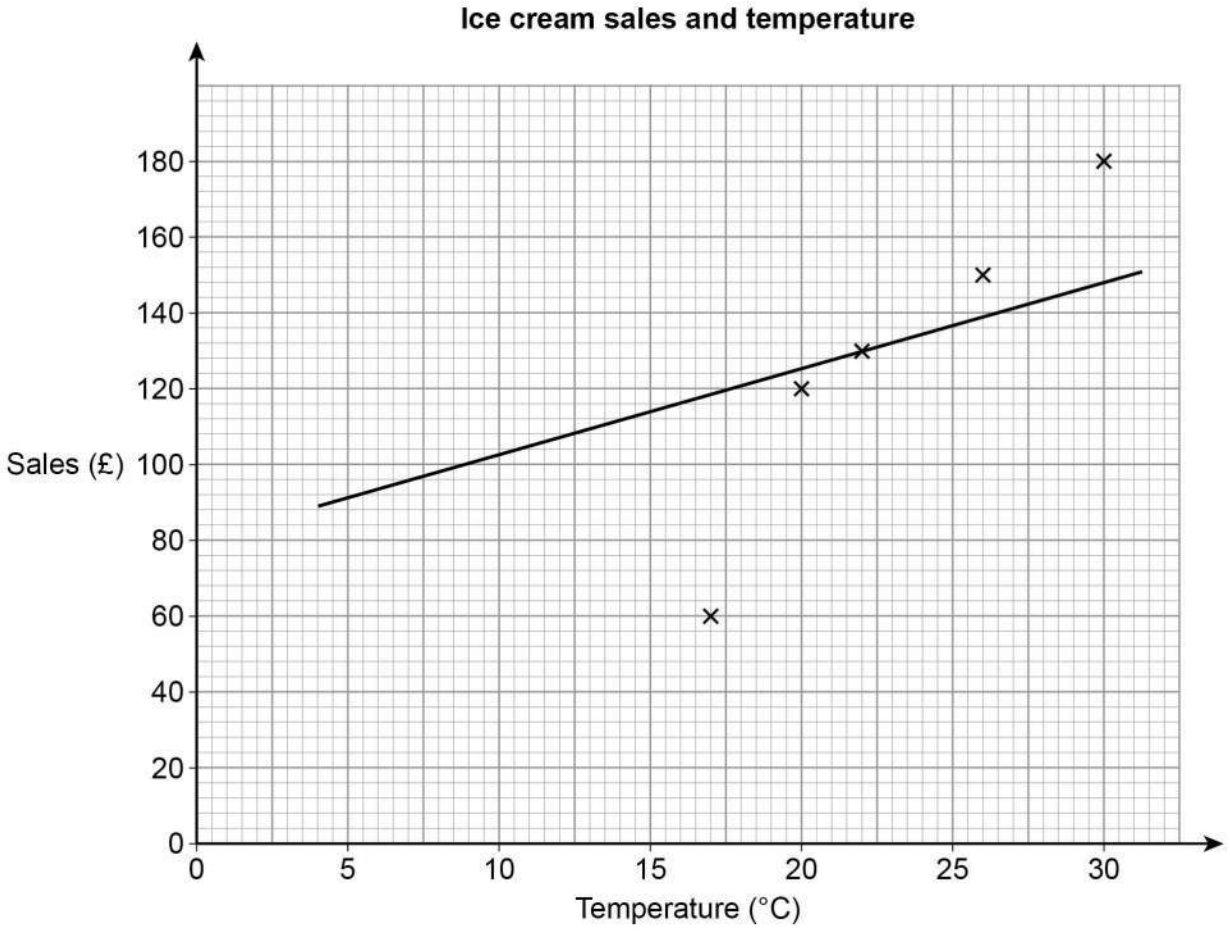
6

12 Lee sells ice creams.

The table shows the midday temperature and his sales for five days.

	Day 1	Day 2	Day 3	Day 4	Day 5
Temperature (°C)	30	26	17	22	20
Sales (£)	180	150	80	130	120

12 (a) He draws this scatter graph and line of best fit.



Write down **two** mistakes he has made.

[2 marks]

Mistake 1 _____

Axes labelled correctly?
Points plotted correctly?
Line of best fit drawn correctly?

_____

Mistake 2 _____

_____

12 (b) Lee wants to work out the range of the five temperatures.

His calculation is 30 – 20 = 10

Is his method correct?

Tick a box.

[1 mark]

Yes ☐ No ☒

Give a reason to support your answer.

12 (c) The table shows Lee's costs.

Ingredients	15% of sales
Fuel	£7 per day

Work out his total profit for the five days.

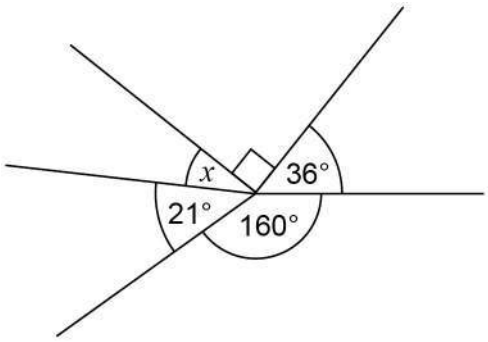
[5 marks]

Profit = income - costs
Calculate total income.
Work out 15% of total.
Calculate fuel for 5 days.

Answer £ _____

8

13



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Work out the size of angle x.

[2 marks]

There are 360° in total around a point.

Answer _____ degrees

14 In this question, use

1 kilogram = 2.2 pounds

1 stone = 14 pounds

Change 70 kilograms into stones.

[3 marks]

Both of the conversions have pounds in common. Convert to pounds then convert to stones.

Answer _____ stones

15 Here are some numbers.

10 13 15 20 27 39

10 15 20 is an arithmetic progression.

Use **three** of the numbers to make a different arithmetic progression.

Describe the rule.

Add or subtract the same amount each step in the sequence.

[2 marks]

Answer _____ _____ _____

Rule _____

7

16 The counters in a bag are red or blue.

One fifth of the counters are red.

Work out the ratio red counters : blue counters

Circle your answer.

[1 mark]

1 : 4 1 : 5 ~~4 : 5~~ 1 : 6

1 out of 5. If 1 part is red, consider how many parts must be blue.

17 Circle the fraction equal to 0.1%

[1 mark]

$\frac{1}{10}$ $\frac{1}{100}$ $\frac{1}{1000}$ $\frac{1}{10\,000}$

To convert percent to fraction, divide by 100.

18 Ellen works for a company that sells cars.

Her **monthly** pay is

- a salary of £1470
- 28% of the total **profit** the company makes from her sales
- a £250 bonus **if** she sells at least 15 cars.

The table shows information about the cars she sold last year.

Total cost to the company	Total income for the company	Number of months when she sold at least 15 cars
£464 500	£538 000	3

Was Ellen's total pay for the **year** more than £40 000?

You **must** show your working.

[6 marks]

1. Calculate 12 months of salary.
2. Calculate the total profit the company makes from her sales. Profit = income - costs.
3. Calculate 28% of the profit.
4. Work out how much she gets for the bonus.
5. Add up all of the payments.
6. Decide if the total pay is more than £40000

Answer _____

8

19 Ben and Katy throw darts at a target.

Ben's ratio of hits to misses is 5 : 1

Katy's ratio of hits to misses is 3 : 1

Ben says,

"5 is bigger than 3, so I must have more hits than Katy."

Give an example to show that this might **not** be true.

[2 marks]

The ratios are proportions, not the number of hits and misses. What is the least amount of hits Ben could have? Could Katy get more than this?

20 A code has 4 digits.

Each digit is a number from 0 to 9

Digits may be repeated.

The code starts 5 4 1

5	4	1	

20 (a) Joe chooses a number at random for the last digit.

Write down the probability that he chooses the correct number.

[1 mark]

How many digits are there?

$$\frac{\text{Correct outcomes}}{\text{Possible outcomes}}$$

Answer _____

20 (b) Amy knows the last digit is odd but **not** 7

She chooses a different odd number at random.

What is the probability that she chooses the correct number?

[1 mark]

Consider how many digits there are which are odd but not 7.

$$\frac{\text{Correct outcomes}}{\text{Possible outcomes}}$$

Answer _____

Turn over for the next question

4

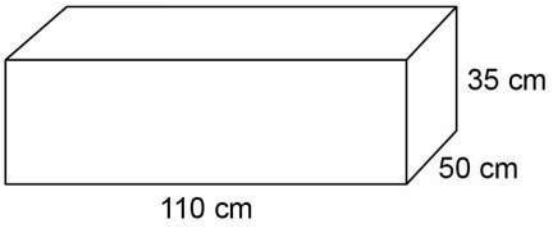
21 Eva thinks she can save water by having a shower instead of a bath.

Eva's shower

uses 10.8 litres per minute

lasts for 8 minutes.

Eva assumes that the water in her bath is in the shape of this cuboid.



1000 cm^3 = 1 litre

21 (a) Using Eva's assumption, work out how many litres of water she saves by having a shower instead of a bath.

[5 marks]

1. Calculate volume used by the shower.
2. Calculate the volume of cuboid/bath (L x W x H) in cm^3.
3. Convert cm^3 to litres.
4. Amount saved = volume of bath - volume used by shower.

Answer _____ litres

21 (b) *A* shows the water level before Eva gets into the bath.

B shows the cuboid in the empty bath.

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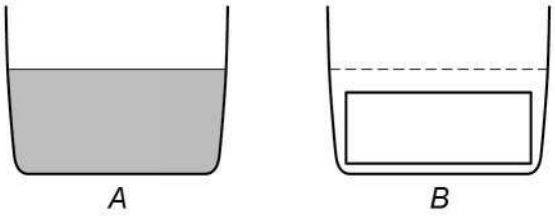


What does this tell you about the amount of water saved?

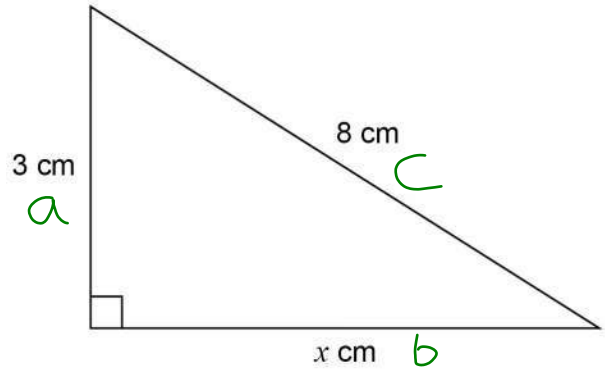
[1 mark]

The volume of the bath is greater than the cuboid and the amount saved was calculated by volume of bath - volume used by shower.

Turn over for the next question

6

22



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Work out the value of x as a decimal.

[3 marks]

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

It's a right angled triangle and there is one unknown side so Pythagoras' Theorem can be used.

Answer _____

23 Lily goes on a car journey.

For the first 30 minutes her average speed is 40 miles per hour.

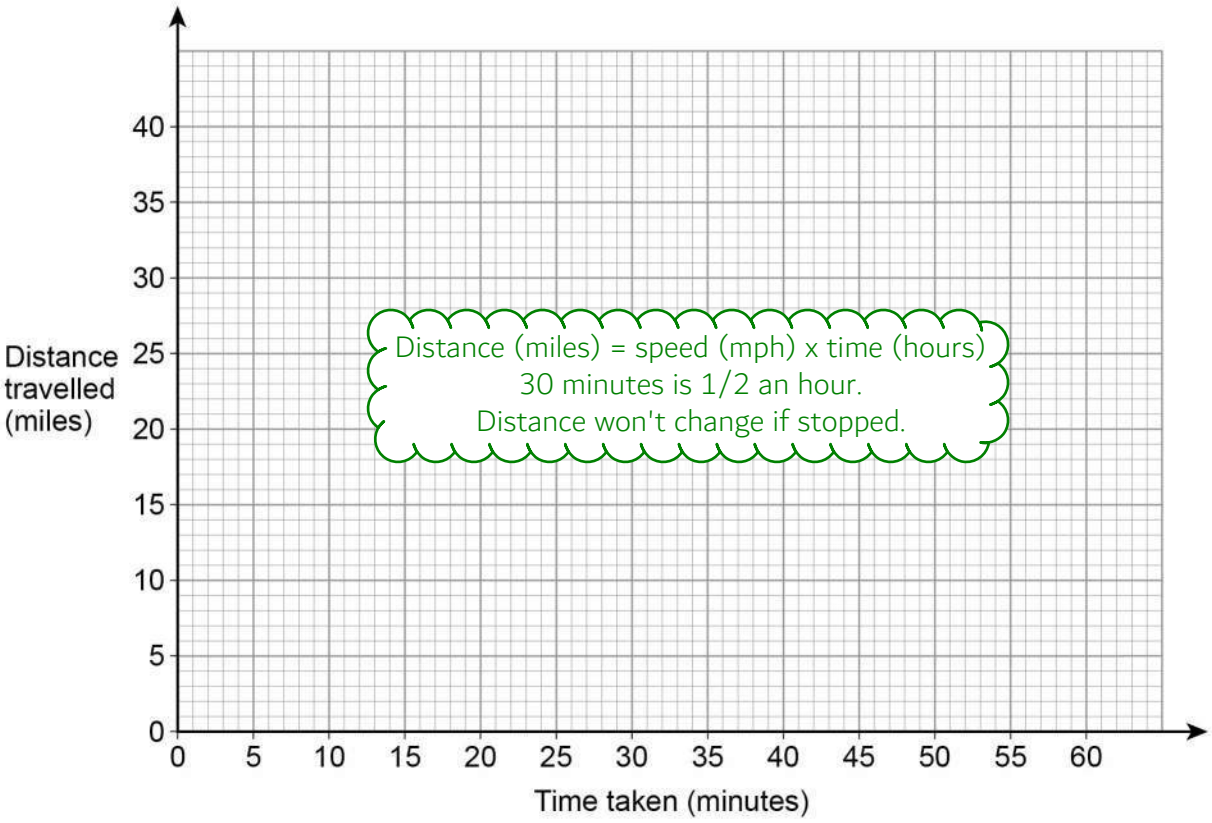
She then stops for 15 minutes.

She then completes the journey at an average speed of 60 miles per hour.

The total journey time is 1 hour.

23 (a) Draw a distance-time graph for her journey.

[3 marks]



23 (b) Write down the average speed for the total journey.

[1 mark]

No calculations required.

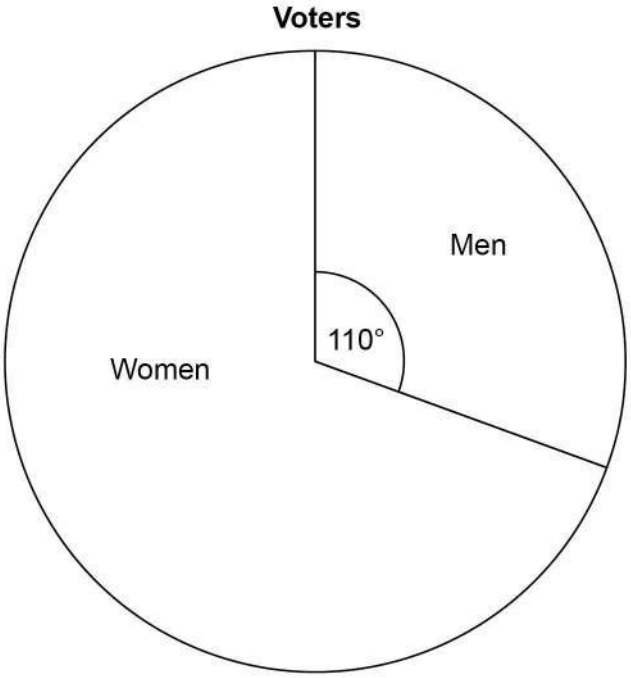
Answer _____ mph

? miles were travelled in an hour.

Turn over for the next question

7

24 The pie chart shows information about voters in an election.



3360 **more** women voted than men.

Work out the total number of voters.

[3 marks]

Work out how many degrees represent the women.
The number of degrees this is more than 110° represents 3360.
Work out how many voters are represented by 1° then 360° as this represents all the voters.

Answer _____

25 The table shows information about some CDs.

Type	Rock	Pop	Jazz
Number of CDs	2	x	$2x + 5$

A CD is chosen at random.

The probability it is **rock** is $\frac{1}{20}$

Work out the probability it is jazz.

[4 marks]

The probability is going to be:

$$\frac{\text{Number of Jazz CDs}}{\text{Number of CDs}}$$

We can find out the number of CDs from the probability that it is Rock and the number of Rock CDs.
To find out the number of Jazz CDs we need to set up and solve an equation involving x.
Adding up the numbers of each type of CD will equal to the total number of CDs.

Answer _____

Turn over for the next question

7

26 (a) Complete the table of values for $y = x^2 - x - 2$

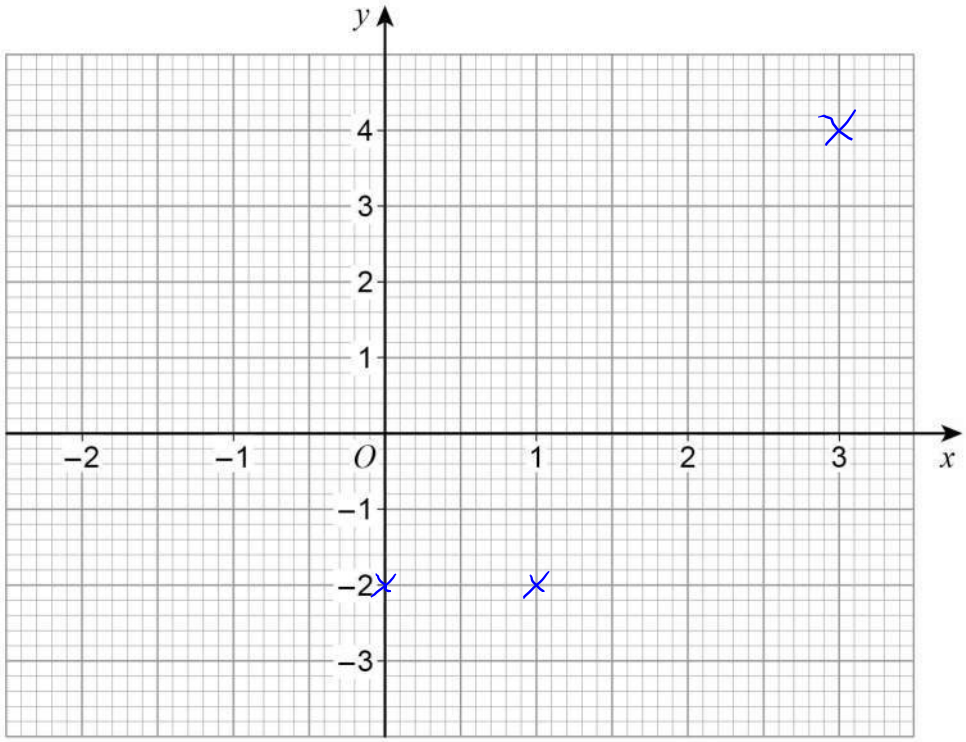
[2 marks]

Substitute -2, -1 then 2 for x.

x	–2	–1	0	1	2	3
y			–2	–2		4

26 (b) Draw the graph of $y = x^2 - x - 2$ for values of x from –2 to 3

[2 marks]



Plot the results you get above onto the graph then join them up with a smooth curve.

27 Write these numbers in **descending** order.

Largest to smallest.

9563 9.56×10^3 9.56×3^{10}

Putting these into a calculator can convert them into ordinary numbers and make them comparable.

[2 marks]

Answer _____ , _____ , _____

28 Rearrange $y = \frac{x}{3} + 9$ to make x the subject.

[2 marks]

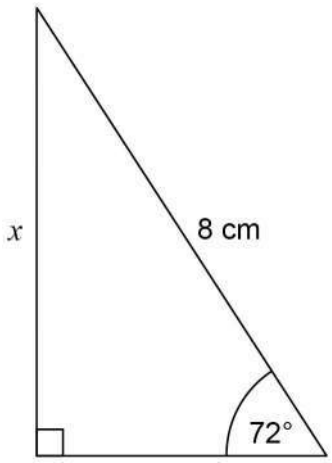
Rearrange to make x the subject by doing the same to both sides. Follow BIDMAS backward to decide what to remove from the left side first.

Answer _____

Turn over for the next question

8

29 Use trigonometry to work out the length x.



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[2 marks]

SOH CAH TOA

Tick what you have and what you are trying to find out.
O- Opposite
A - Adjacent
H - Hypotenuse
S - Sin of the angle
C - Cos of the angle
T- Tan of the angle
The one with two ticks is the formula you need to use.

Answer _____ cm

END OF QUESTIONS

2