Please write clearly in block capitals.

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

Surname _____

Forename(s) _____

Candidate signature _____

GCSE MATHEMATICS

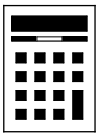
F

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

.CG Maths.

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

2 Circle the multiple of both 8 and 12

[1 mark]

4 | 32 | 72 | 108

8 x 9 = 72
12 x 6 = 72

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]

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

-4 is less than -3

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

Write down your full calculator display.

[1 mark]

Answer 26.476404459

Type into the calculator then press the SD button

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

[1 mark]

Answer 26.5

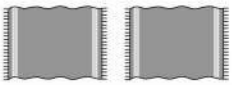
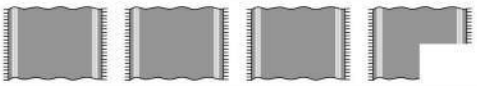
The 2nd decimal place is a 7 so this means the 4 in the 1st place rounds up to a 5.

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 4 people

Male	
Female	
Family	

8 people used the Male changing room.

6 (a) Complete the key. **[1 mark]**

2 symbols represents 8
8/2 = 4

6 (b) How many people used the Female changing room? **[1 mark]**

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

Answer 15

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 sample is too small

The sample was only taken for an hour and this is not enough time to represent the usage of the lockers in general. The results are very likely to be heavily influenced by random chance.

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.
(9 + 1)/2 = 5
So the 5th smallest value is the median.

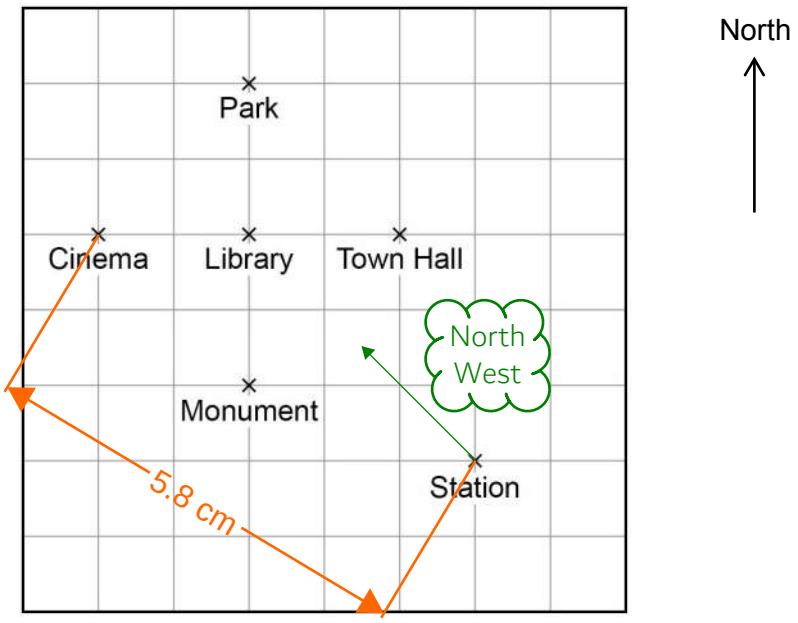
Answer 23

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.

[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 180° clockwise to face the Monument.

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

[3 marks]

5.8 X 200

Every cm represents 200m so this works out 5.8 lots of 200m. 5.8cm as measured on the diagram.

Answer 1160 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]

Unlikely to be able to walk in a straight line

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	84.09
15/12/2016	Salary	856.21		940.30

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

212.48 - 128.39 = 84.09
84.09 + 856.21 = 940.3

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]

$\frac{11}{9} \times 36$

'Of' means to multiply

Answer 44 years

11 Solve $4x - 3 = 14$

[2 marks]

$4x = 17$

Add 3 to both sides then divide by 4 to make x the subject.

$x = \frac{17}{4}$

Turn over for the next question

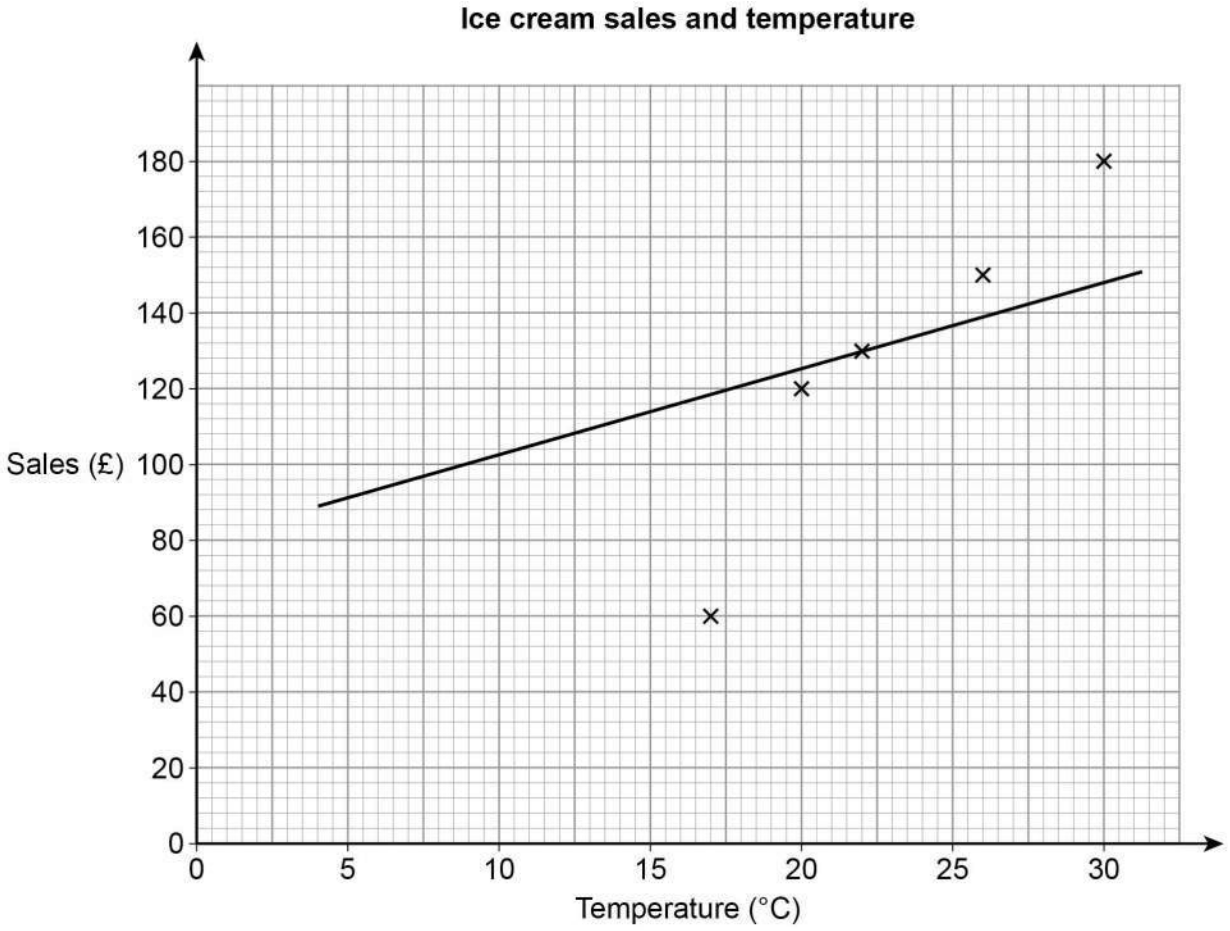
6

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 Day 3 Plotted Wrong

Mistake 2 The line of best Fit doesn't Fit the data well

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.

Should be 30 - 17 (Range is largest subtract the smallest)

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]

180 + 150 + 80 + 130 + 120 = 660 (Total sales)

0.15 x 660 = 99 (15% of sales)

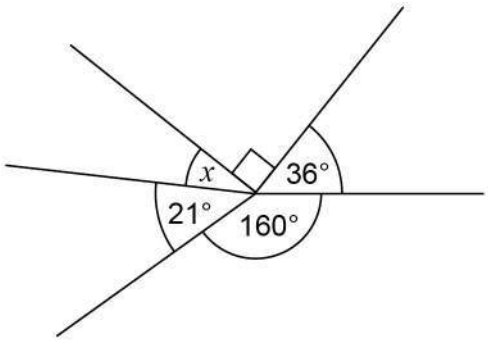
5 x 7 = 35 (£7 of fuel for 5 days)

660 - 99 - 35 (Profit = income - costs)

Answer £ S26

8

13



Not drawn accurately

Work out the size of angle x.

[2 marks]

360 - 90 - 36 - 160 - 21

There are 360° in total around a point.
Subtracting the other angles leaves x.

Answer 53 degrees

14 In this question, use

1 kilogram = 2.2 pounds

1 stone = 14 pounds

Change 70 kilograms into stones.

[3 marks]

$70 \times 2.2 = 154$

$\frac{154}{14}$

Every kg is 2.2 pounds so 70 lots of 2.2 converts to pounds.

Working out how many lots of 14 pounds there are as each lot is 1 stone.

Answer 11 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.

[2 marks]

Answer 20 15 10

Rule Subtract 5

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; there are 5 parts in total so 4 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]

1470 X 12 = 17640 ← 12 months of £1470 salary.

538000 - 464500 = 73500 ← The total profit the company makes.

73500 X 0.28 = 20580 ← 28% of the profit.

250 X 3 = 750 ← 3 lots of the bonus.

17640 + 20580 + 750 = 38970 ← Total pay.

It was less than 40000, not more.

Answer No

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 = 6 : 2

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]

Ben could have had 5 hits and 1 miss.

Katy could have had 6 hits and 2 misses.

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]

There are 10 possible digits (don't forget about 0).

Answer $\frac{1}{10}$

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]

The possible odd digits are 1, 3, 5 and 9. Out of these, only one is correct.

Answer $\frac{1}{4}$

Turn over for the next question

4

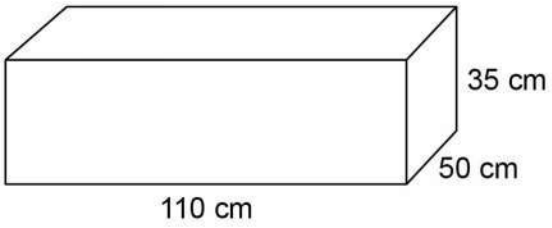
21 Eva thinks she can save water by having a shower instead of a bath.

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]

$10.8 \times 8 = 86.4$ ← 10.8 litres for 8 minutes. This works out how much is used by the shower.

$110 \times 50 \times 35 = 192500$ ← Calculating the volume of the cuboid/bath in cm^3.

$\frac{192500}{1000} = 192.5$ ← Converting cm^3 to litres.

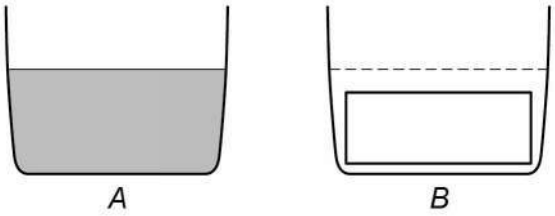
$192.5 - 86.4$ ← The difference between the bath and the shower.

Answer 106.1 litres

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

B shows the cuboid in the empty bath.

Not drawn accurately



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

[1 mark]

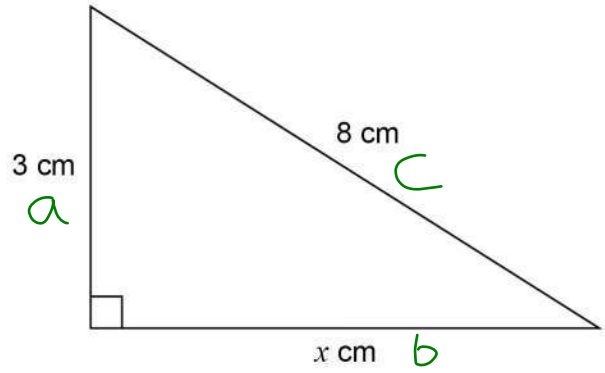
More was Saved

As 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



Not drawn accurately

Work out the value of x as a decimal.

[3 marks]

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

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

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

$= \sqrt{8^2 - 3^2}$

$= \sqrt{55}$

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

Answer 7.4

23 Lily goes on a car journey.

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

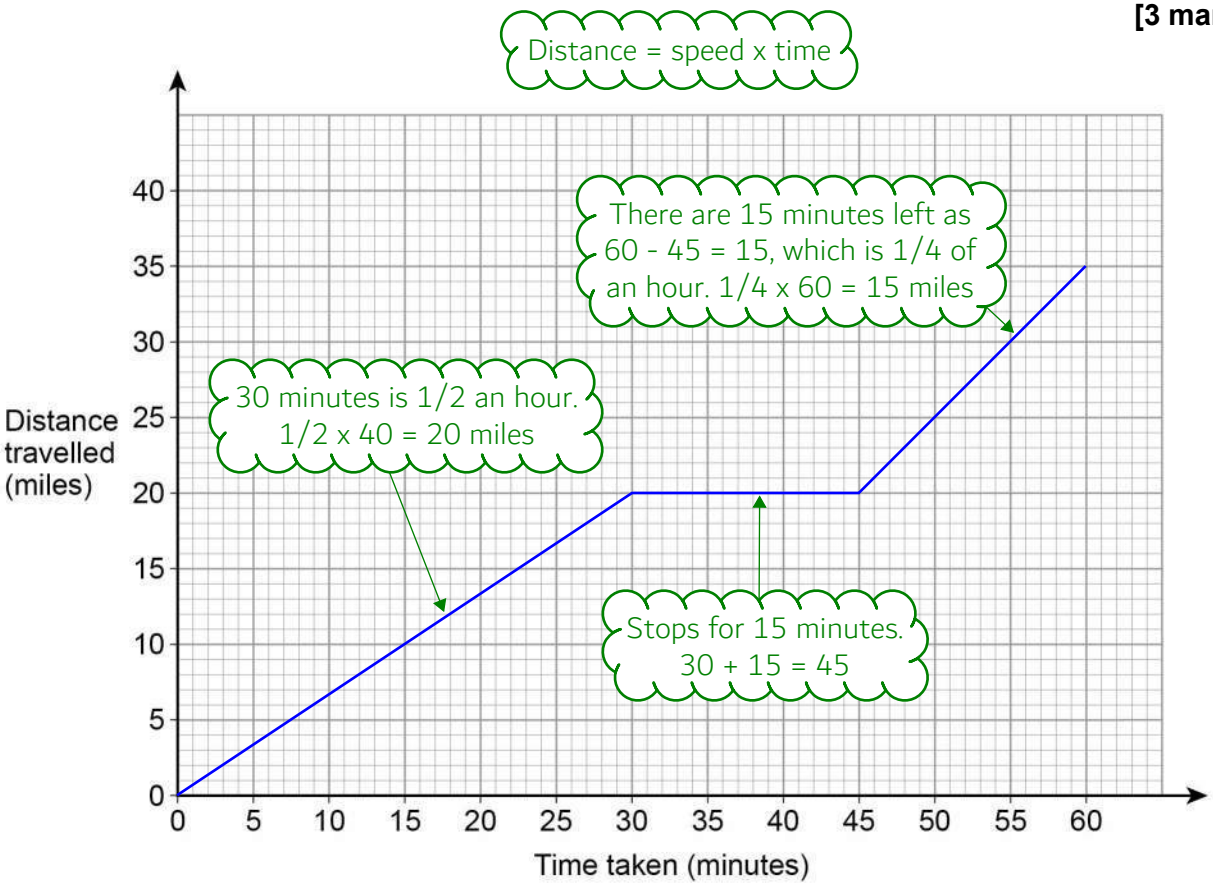
She then stops for 15 minutes.

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]

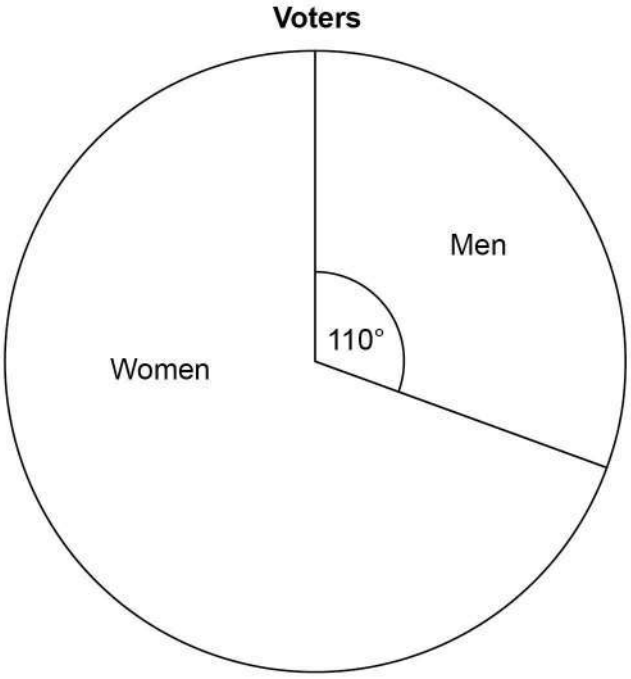
Answer 35 mph

35 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]

The number of degrees which represents the women.

$360 - 110 = 250$

$250 - 110 = 140$

The number of degrees which represents the difference between the men and women.

$\frac{3360}{140} = 24$

The number of voters represented by 1°.

24×360

360° represents all of the voters.

Answer 8640

https://youtu.be/oMiyMrII_38

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]

1/20 of the CDs are Rock as the probability is 1/20, so there must be 40 CDs in total as 2 x 20 = 40
Adding up all the expressions for the number of CDs for each type would give 40.

$2 + x + 2x + 5 = 40$

$3x + 7 = 40$

$3x = 33$

$x = 11$

$2 \times 11 + 5 = 27$

Answer $\frac{27}{40}$

https://youtu.be/dDDAatr95BA

Turn over for the next question

7

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

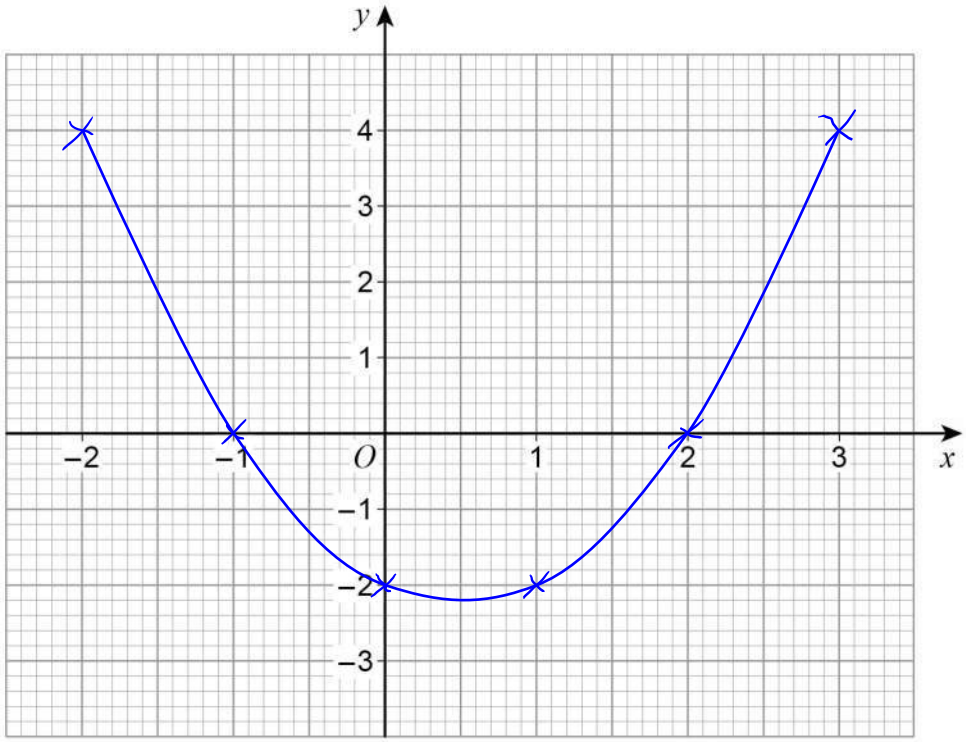
[2 marks]

$(-2)^2 - (-2) - 2 = 4$ $(-1)^2 - (-1) - 2 = 0$ $2^2 - 2 - 2 = 0$

x	–2	–1	0	1	2	3
y	4	0	–2	–2	0	4

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

[2 marks]



https://youtu.be/MxtOJjO_Pyo

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

9563 9.56×10^3 9.56×3^{10}

$9.56 \times 10^3 = 9560$
$9.56 \times 3^{10} = 564508.44$

[2 marks]

Answer 9.56×3^{10} , 9563 , 9.56×10^3

https://youtu.be/hNhvFJ0xJpY

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

[2 marks]

$y - 9 = \frac{x}{3}$

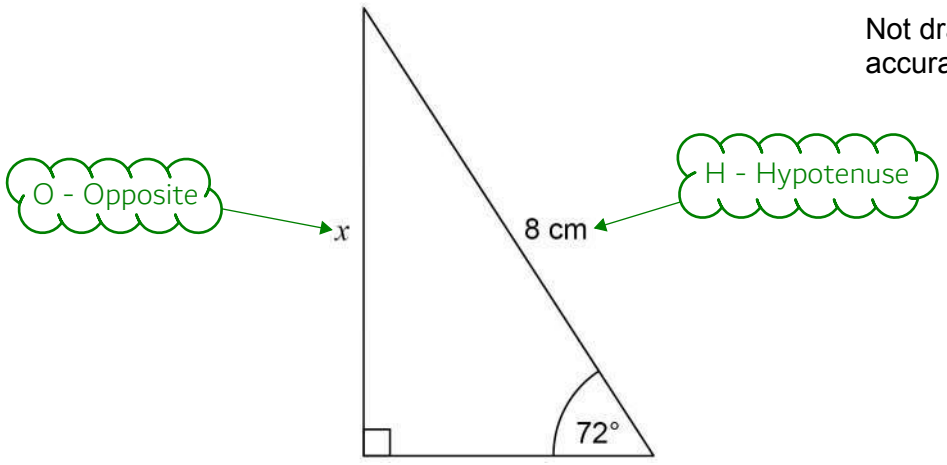
Subtract 9 from both sides then multiply them by 3.

Answer $x = 3(y - 9)$

Turn over for the next question

8

29 Use trigonometry to work out the length x.



[2 marks]

SOH CAH TOA

Two ticks on SOH so we use this formula triangle. Covering over O (what we are trying to find) gives:
Opposite = Sin of the angle x Hypotenuse

$x = \sin 72 \times 8$ sin(72) x 8 = 7.60845213

Answer 7.6 cm

https://youtu.be/f8rA-dU7J_o

END OF QUESTIONS

2