AQA

MATHS MADE EASY

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	

Do not write outside the box

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

$8 \times 9 = 72, \quad 12 \times 6 = 72$

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

Circle your answer.

[1 mark]

1.05 | 1.1 | 1.5 | 3.2

$3 \div 2 = 1.5$

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4 Circle the correct statement.

[1 mark]

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

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

Write down your full calculator display.

[1 mark]

Answer 26.47640459

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

[1 mark]

Answer 26.5

Turn over for the next question

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]**

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

4 + 4 + 4 + 3 = 15

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]

THIS IS A SMALL SAMPLE OF PEOPLE, ONLY TAKEN OVER THE COURSE OF ONE HOUR, SO IT MIGHT NOT BE REPRESENTATIVE OF HOW OFTEN EACH CHANGING ROOM IS ACTUALLY USED.

7 Here is a list of numbers.

21 17 23 21 29 32 21 25 36

Work out the median.

[2 marks]

17 21 21 21 (23) 25 29 32 36

Answer 23

Turn over for the next question

5

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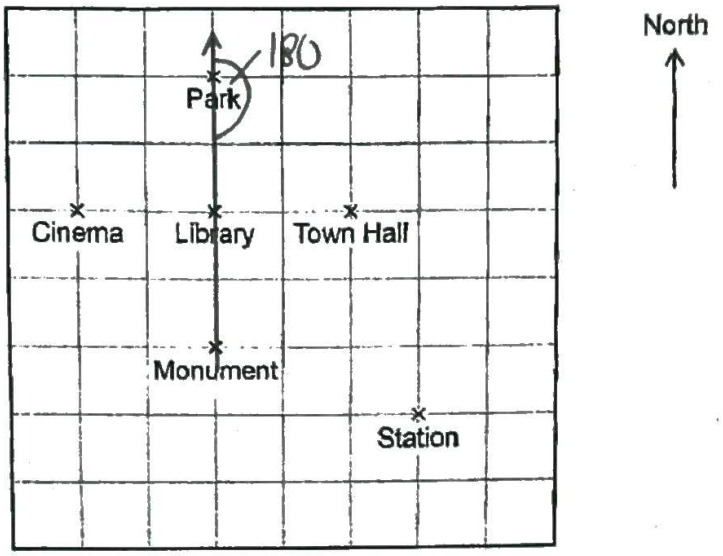
8 Here is a map of a town.

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.

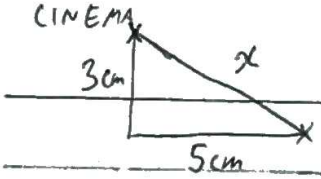
[1 mark]

090° 180° 270° 360°

Do not write outside the box

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

[3 marks]



$x^2 = 3^2 + 5^2 = 34$

$\Rightarrow x = \sqrt{34}$ cm

1cm → 200m, so $\sqrt{34}$ cm = $200\sqrt{34}$ m

= 1166 m (4s.f.)

Answer 1166 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]

YOU MIGHT NOT BE ABLE TO WALK ALONG THE STRAIGHT LINE BETWEEN THEM, THERE MIGHT BE BUILDINGS ETC. IN THE WAY

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

MONEY IN MONEY OUT

212.48 − 128.39 = 84.09

84.09 + 856.21 = 940.30

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]

$\frac{11}{9} \times 36 = 44$

Answer 44 years

11 Solve $4x - 3 = 14$

[2 marks]

$+3$	$4x - 3 = 14$	$+3$
	$4x = 17$	
$\div 4$	$x = \frac{17}{4}$	$\div 4$

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

Turn over for the next question

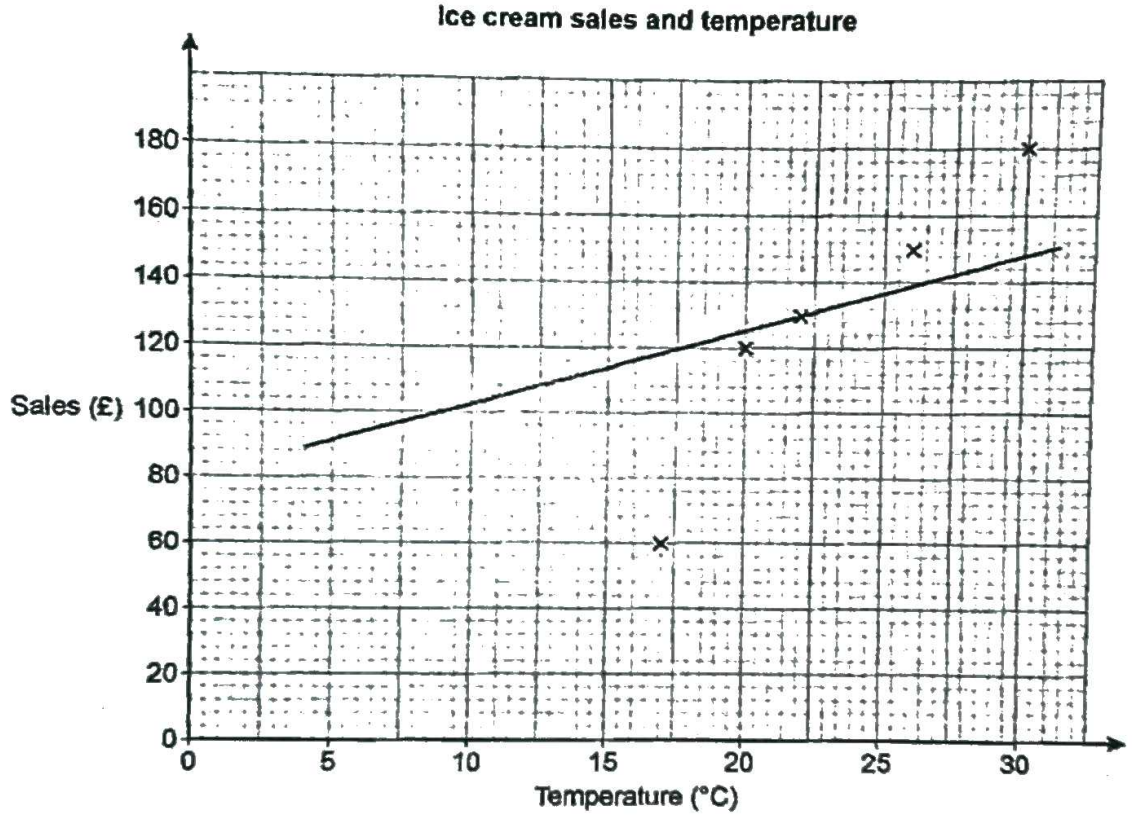
6

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 HIS DAY 3 SALES WERE £80, BUT HE PLOTTED THE POINT AT £60

Mistake 2 HIS LINE OF BEST FIT DOES NOT FIT WITH THE PLOTTED DATA POINTS.

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.

20°C IS NOT THE SMALLEST VALUE, 17 IS.

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]

TOTAL SALES = 180 + 130 + 80 + 130 + 120 = £660

INGREDIENTS COST = 660 × 0.15 = £99

FUEL COST = £7 × 5 = £35

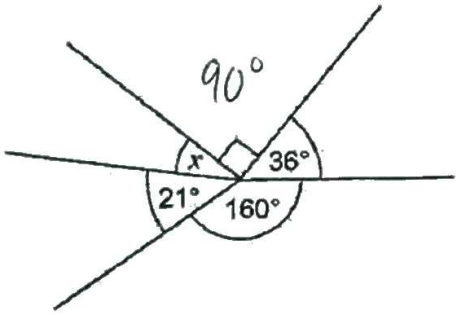
PROFIT = 660 − 35 − 99 = £526

Answer £ 526

8

Do not write outside the box

13



Not drawn accurately

Work out the size of angle x.

[2 marks]

· RIGHT ANGLE = 90°

90 + 21 + 36 + 160 = 307

360 - 307 = 53

Answer 53 degrees

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14 In this question, use

1 kilogram = 2.2 pounds

1 stone = 14 pounds

Change 70 kilograms into stones.

[3 marks]

70 kg = (70 × 2.2) pounds = 154 pounds

154 pounds = $\left(\frac{154}{14}\right)$ stone = 11 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 15 27 39

Rule STARTING AT 15, ADD 12 EACH STEP

7

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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

$RED = \frac{1}{1+4} = \frac{1}{5}$

17 Circle the fraction equal to 0.1%

[1 mark]

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

$0.1\% = \frac{0.1}{100} = \frac{1}{1000}$

Do not write outside the box

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 YEAR SALARY PAY = £1470 × 12 = £17,640

PROFIT FROM SALES = 538,000 − 464,500 = £73,500

28% OF PROFIT = 73,500 × 0.28 = £20,580

BONUSES = 3 × 250 = £750

TOTAL EARNINGS = 17,640 + 20,580 + 750

= £38,970 < £40,000

SO NO, SHE DOESN'T MAKE MORE THAN £40,000 IN THIS YEAR

Answer NO

8

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19 Ben and Katy throw darts at a target.

Ben's ratio of hits to misses is 5 : 1 ← TOTAL = 6

Katy's ratio of hits to misses is 3 : 1 ← TOTAL = 4

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]

SUPPOSE BEN THROWS 6 DARTS.

RATIO = 5:1, SO HE GETS 5 HITS

SUPPOSE KATY THROWS 8 DARTS.

RATIO = 3:1 = 6:2, SO SHE GETS 6 HITS

↑ TOTAL = 8

6 > 5, SO KATY HAS MORE HITS IN THIS INSTANCE

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]

Answer 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]

1, 3, 5, 9

4

Answer 1/4

Turn over for the next question

4

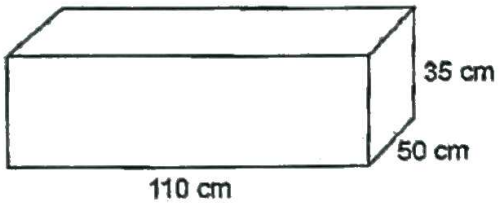
21 Eva thinks she can save water by having a shower instead of a bath.

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.

[6 marks]

VOLUME OF CUBOID = 110 × 50 × 35 = 192,500cm^3

192,500 ÷ 1000 = 192.5 litres FOR A BATH

10.8 × 8 = 86.4 litres FOR A SHOWER

WATER SAVED = 192.5 − 86.4 = 106.1

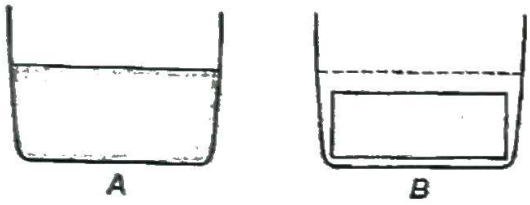
Answer 106.1 litres

Do not write outside the box

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]

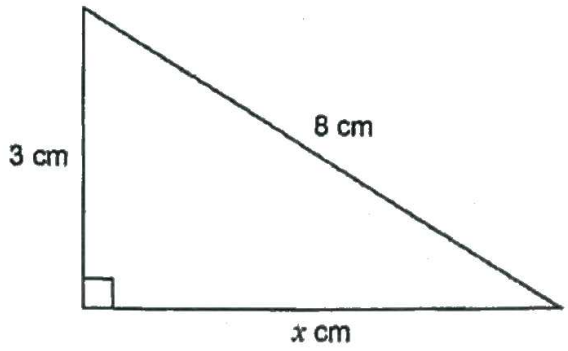
IT'S GREATER THAN THE AMOUNT WE CALCULATED

Turn over for the next question

6

MATHS MADE EASY

22



Not drawn accurately

Work out the value of x as a decimal.

[3 marks]

$3^2 + x^2 = 8^2$

$9 + x^2 = 64$ – 9

$x^2 = 55$ – 9

$x = \sqrt{55}$

$\sqrt{55} = 7.416198...$

$= 7.4$ (1 d.p.)

Answer 7.4 cm

Do not write outside the box

23 Lily goes on a car journey.

For the first 30 minutes her average speed is 40 miles per hour. $0.5 \times 40 = 20$ miles

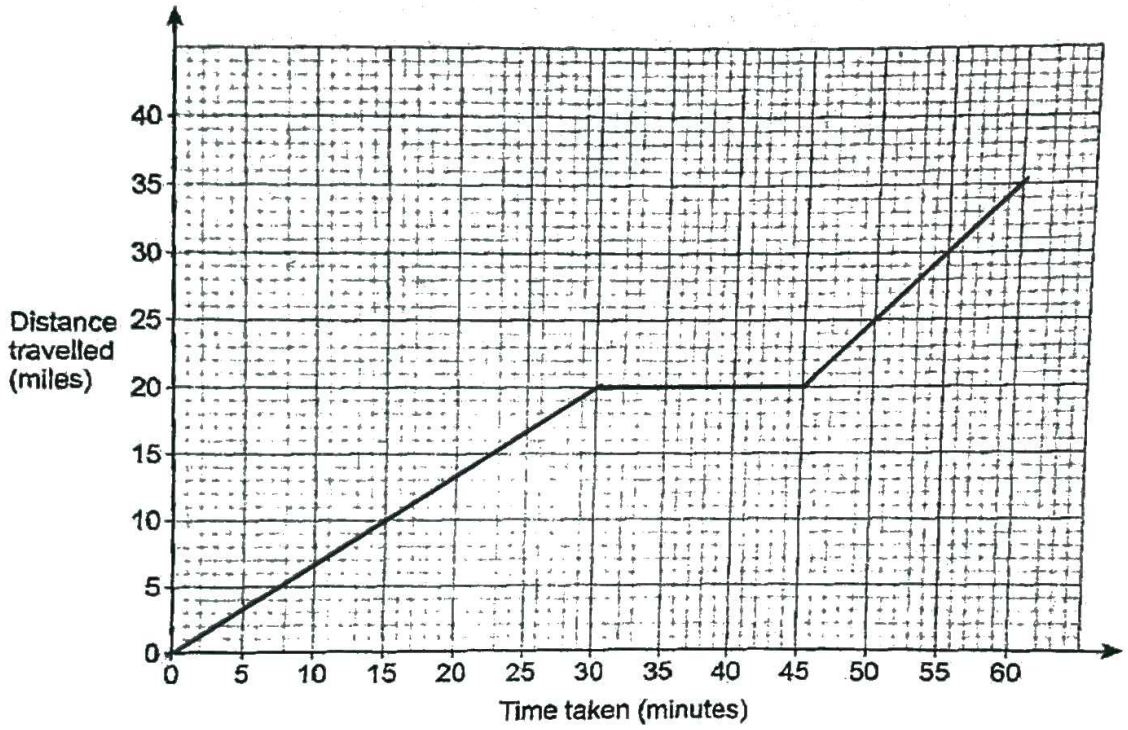
She then stops for 15 minutes.

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

The total journey time is 1 hour. $0.25 \times 60 = 15$ miles

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]

1 HOUR, SPEED = $\frac{35}{1}$ = 35 mph

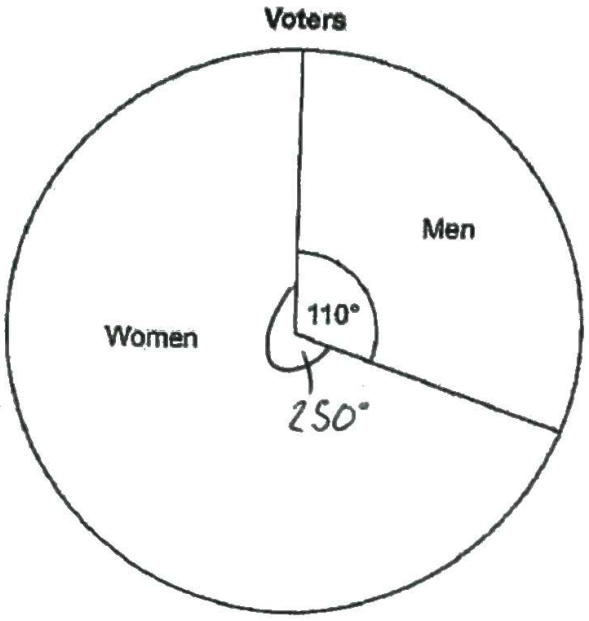
Answer 35 mph

Turn over for the next question

7

MATHS MADE EASY

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]

360 − 110 = 250° FOR WOMEN

DIFFERENCE = 250 − 110 = 140

3360 ÷ 140 = 24 PEOPLE PER DEGREE

24 × 360 = 8640 TOTAL PEOPLE

Answer 8640

Do not write outside the box

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]

$\frac{1}{20} = \frac{2}{40}$, SO THERE ARE 40 CDs IN TOTAL.

THEREFORE, $2 + x + 2x + 5 = 40$

$\Rightarrow$

$3x + 7 = 40$

-7 -7

$3x = 33$

$\div 3$ $\div 3$

$x = 11$

NUMBER OF JAZZ CDs: $2x + 5 = (2 \times 11) + 5 = 27$

PROBABILITY = $\frac{27}{40}$

Answer $\frac{27}{40}$

Turn over for the next question

7

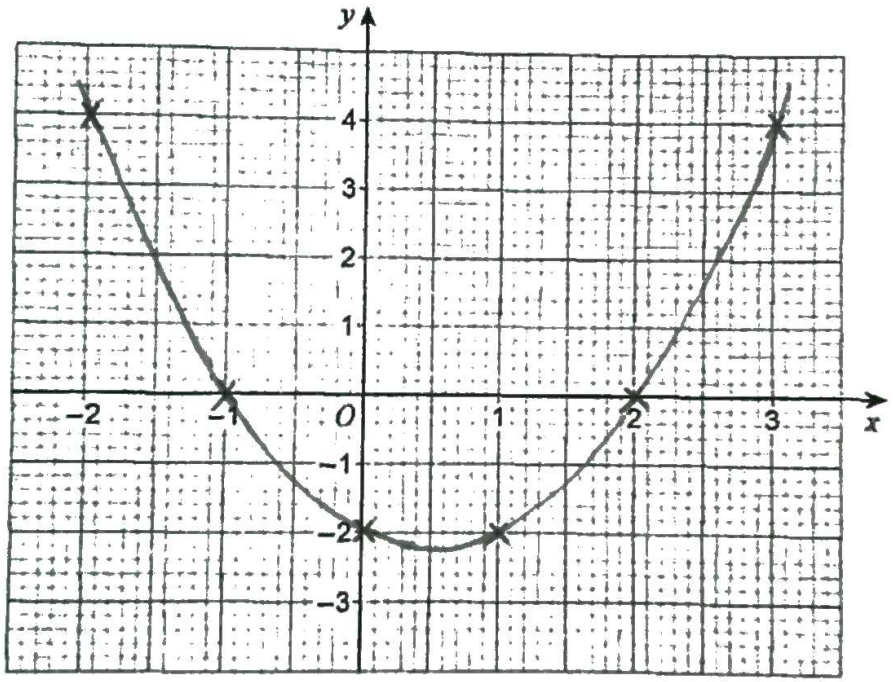
26 (a) Complete the table of values for $y = x^2 - x - 2$

[2 marks]

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]



Do not write outside the box

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

9563	9.56×10^3	9.56×3^{10}
9,563	9,560	59,069

[2 marks]

Answer 9.56×3^{10} , 9563 , 9.56×10^3

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

[2 marks]

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

$y - 9 = \frac{x}{3}$ (−9)

$3(y-9) = x$ (×3)

$x = 3(y-9) = 3y - 27$

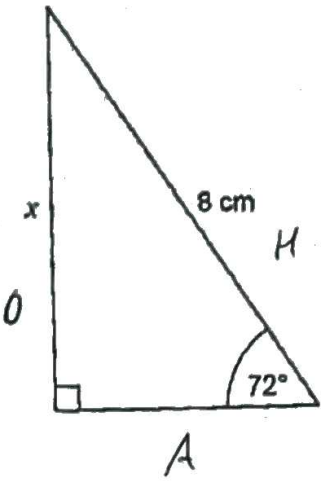
Answer $x = 3y - 27$

Turn over for the next question

8

Do not write outside the box

29 Use trigonometry to work out the length x.



Not drawn accurately

SOHCAHTOA

O

H

A

[2 marks]

$\sin(72) = \frac{O}{H} = \frac{x}{8}$

$\Rightarrow x = \sin(72) \times 8 = 7.6$ cm (1 d.p.)

Answer 7.6 cm

END OF QUESTIONS

2

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