

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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

**Wednesday 7 June 2023**

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, Formulae Sheet (enclosed). 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.
- 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 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](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 6184 correct to the nearest hundred.

The 1 is in the hundreds places. The 8 after it causes it to round up to a 2. Everything after the hundreds is then set to 0

6200

(Total for Question 1 is 1 mark)

2 Write 0.7 as a fraction.

0.7 can be put into the calculator and it should convert it into a fraction when pressing = (or EXE)

$\frac{7}{10}$

(Total for Question 2 is 1 mark)

3 Change 9 metres into centimetres.

There are 100 cm in 1 m so multiplying the 9 by 100 converts it into centimetres

900

centimetres

(Total for Question 3 is 1 mark)

4 Simplify  $3 \times 4t$

The 3 can be multiplied by the 4. Writing the t next to the result means that it is multiplied by t

12t

(Total for Question 4 is 1 mark)

5 Here is a list of numbers.

20      40      60      80      100

One of these numbers is a multiple of 25

Which number?

$100 \div 25 = 4$ . So 100 is a multiple of 25 as it is  $4 \times 25$

100

(Total for Question 5 is 1 mark)

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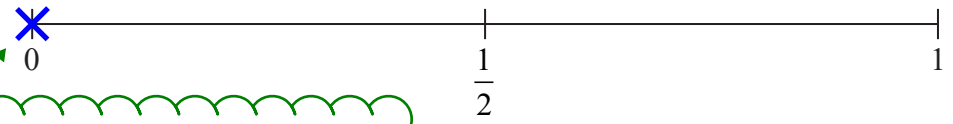


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6 Shari has a fair ordinary dice.  
She rolls the dice once.

The outcomes on an ordinary dice are 1, 2, 3, 4, 5, 6

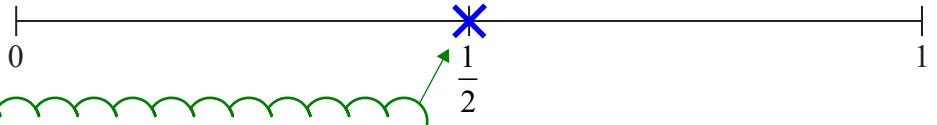
(a) On the probability scale, mark with a cross (×) the probability that Shari gets the number 7



It is impossible to get a 7 so the probability is 0

(1)

(b) On the probability scale, mark with a cross (×) the probability that Shari gets an even number.



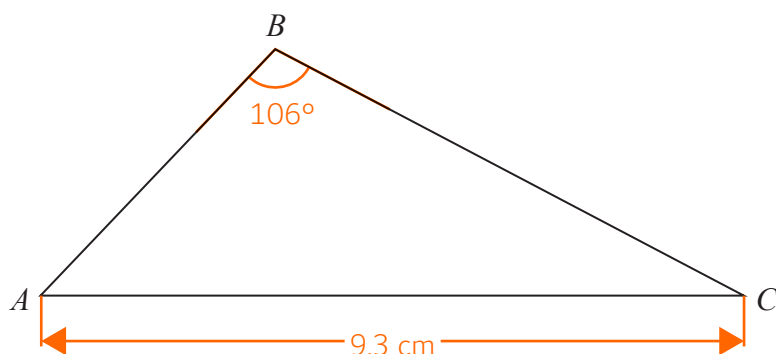
2, 4, 6 are even. This is 3 out of the 6 outcomes so the probability is  $\frac{3}{6}$ , which simplifies to  $\frac{1}{2}$

(1)

(Total for Question 6 is 2 marks)



- 7 Here is a triangle.  
The triangle is accurately drawn.



- (a) Measure the length of  $AC$ .

Measured using a ruler

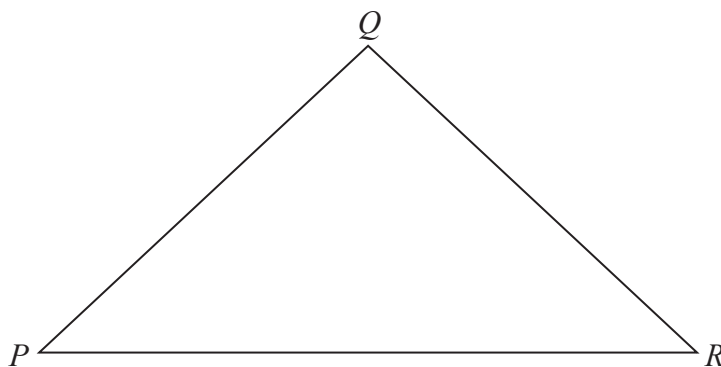
.....  $9.3$  ..... cm  
(1)

- (b) Measure the size of angle  $B$ .

Measured using a protractor

.....  $106$  .....  $^\circ$   
(1)

Here is a different triangle.



$$QP = QR$$

- (c) Write down the mathematical name of this triangle.

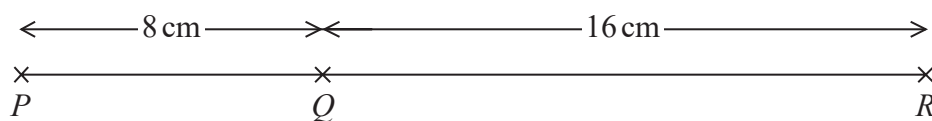
It is a triangle with two equal sides

.....  $Isosceles$  .....

(1)

(Total for Question 7 is 3 marks)

8 The diagram shows three motorway service stations  $P$ ,  $Q$  and  $R$  on a map.



The map has a scale of  $1 \text{ cm} = 4 \text{ km}$ .

Work out the real distance from  $P$  to  $R$ .

$8 + 16$

Adding the distance PQ to the distance QR works out that the distance from P to R is 24 cm on the map

$24 \times 4$

24 cm is 24 times 1 cm, so the 4 km which is represented by 1 cm should be multiplied by 24

..... 96 ..... km

(Total for Question 8 is 3 marks)

9 Here are the first five terms of a sequence.

3      8      13      18      23

(a) Write down the next term of this sequence.

The sequence increases by 5 between each term.  $23 + 5 = 28$

..... 28

(1)

(b) Write down the ratio of the second term to the fourth term.  
Give your ratio in its simplest form.

8 : 18

The second term is 8 and the fourth term is 18. Writing these in a ratio

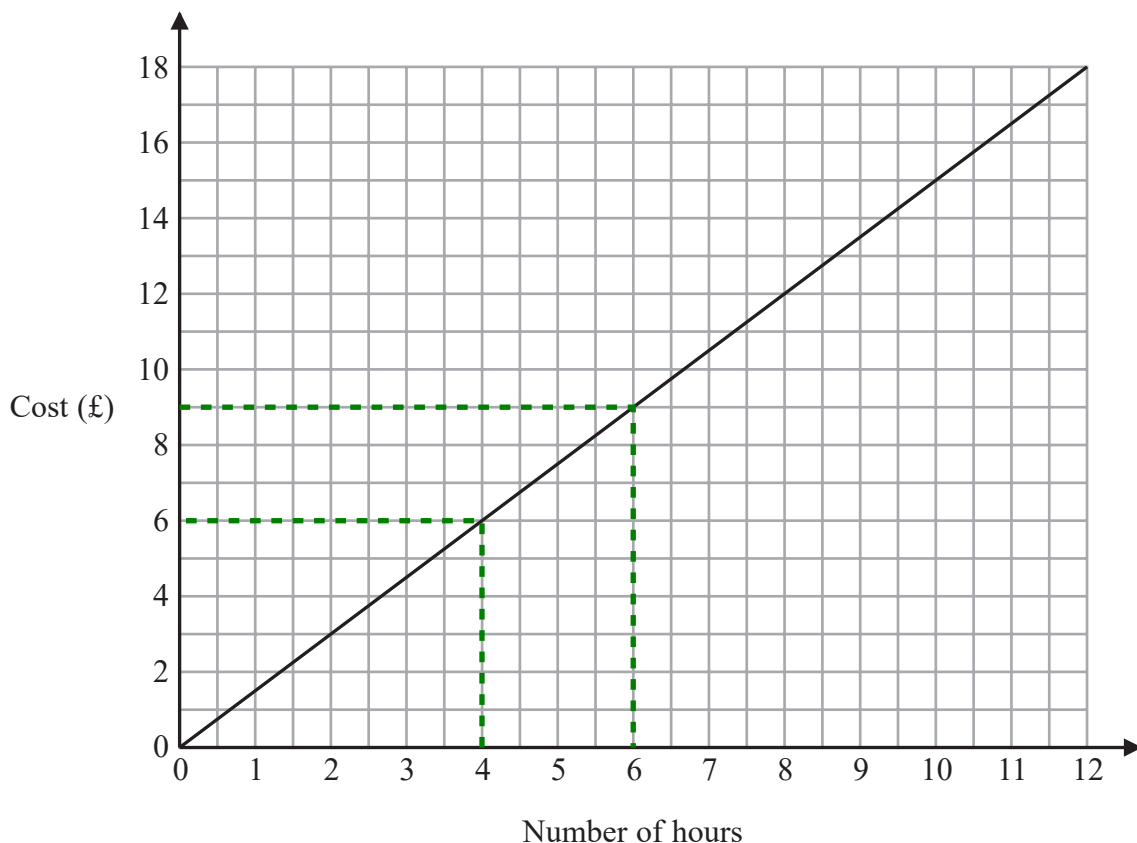
Dividing both sides of the ratio by 2 simplifies the ratio to  $4 : 9$ . It cannot go any simpler as 4 and 9 cannot be divided by the same amount to get smaller whole numbers

..... 4 : 9

(2)

(Total for Question 9 is 3 marks)

10 This graph can be used to find the cost of parking a car in a car park for up to 12 hours.



(a) Use the graph to find the cost of parking a car for 4 hours.

Reading up from 4 hours to the line then across to the cost

£ ..... 6  
(1)

Justin drives into the car park at 08 00 in the morning.  
When he drives out of the car park he has to pay £9

(b) At what time does Justin drive out of the car park?

8 + 6 ← Reading across from the cost of £9 to the line then down finds that the car was parked for 6 hours. Adding these 6 hours to the 8 hours from 08 00 works out the time in 24 hour time

..... 14 00  
(3)

(Total for Question 10 is 4 marks)



11 The table shows information about the weights of the people in a hotel lift.

Weight	Number of people		
40 kg	×	1	= 40
50 kg	×	2	= 100
60 kg	×	4	= 240
70 kg	×	5	= 350
80 kg	×	3	= 240
90 kg	×	1	= 90
			<u>1060</u>

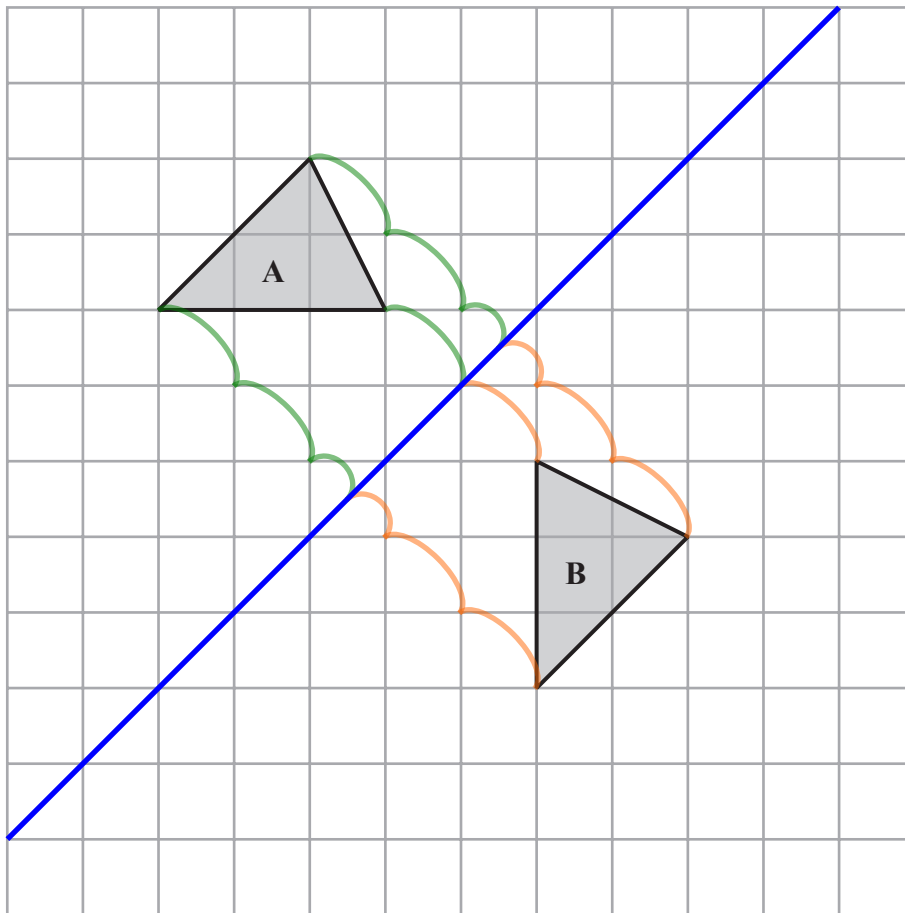
Show that the total weight of the people in the lift is less than 1200 kg.

Multiplying the weights by the number of people of each weight works out the total weight of all the people of each weight. Adding these totals gives the total weight of the people in the lift as 1060 kg, which is less than 1200 kg

(Total for Question 11 is 3 marks)



12 Shape A is reflected in a mirror line to give shape B.



(a) On the grid, draw the mirror line.

(1)

The line drawn is halfway between shapes A and B and is so that B is a reflection of A on this line. It is the same number of diagonal jumps to the line from each corner on each shape

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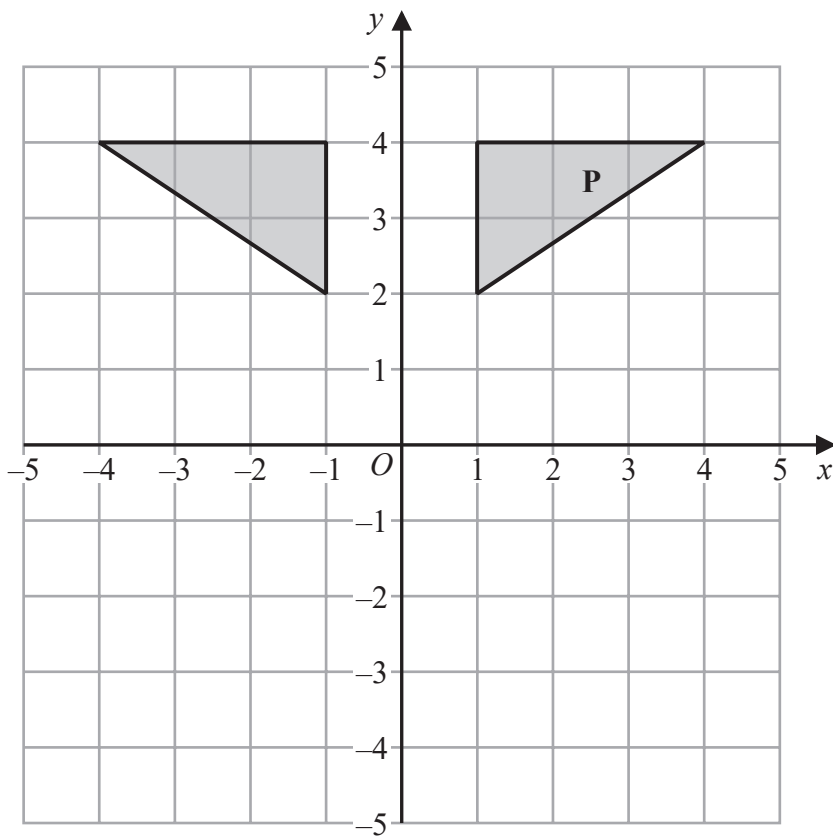


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(b) Alex is asked to reflect shape **P** in the  $x$ -axis.  
Here is the diagram Alex draws.



Explain the mistake Alex has made.

It has not been reflected in the  $x$ -axis

It has instead been reflected in the  $y$ -axis

(1)

(Total for Question 12 is 2 marks)



13 There are 50 teachers in a school.

This is  $\frac{1}{16}$  of the total number of people in the school.

Work out the total number of people in the school.

$50 \times 16$

Doing  $1/16$  of the total number of people in the school is dividing by 16. The opposite of dividing is multiplying so goes back from the  $1/16$  to the full amount

800

(Total for Question 13 is 2 marks)

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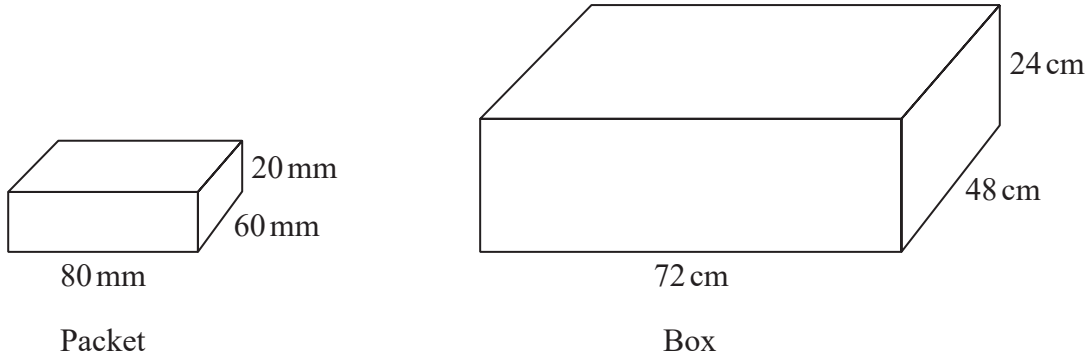


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14 Packets of sweets are put into boxes.



Each packet is a cuboid, 80 mm by 60 mm by 20 mm.  
Each box is a cuboid, 72 cm by 48 cm by 24 cm.

Work out the greatest number of packets that can be put into each box.

$$720 \div 80 = 9$$

$$480 \div 60 = 8$$

$$240 \div 20 = 12$$

Converting the centimetres into millimetres by multiplying each length of the box by 10. Dividing each length of the box by each length of the packet works out how many packets fit along each length of the box

$$9 \times 8 \times 12$$

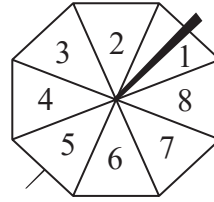
Multiplying the number of packets which fit along each length of the box works out how many packets that can be put into each box

864

(Total for Question 14 is 4 marks)



15 Here is a fair ordinary dice and a fair 8-sided spinner.



Charlie throws the dice once and spins the spinner once.

Is Charlie more likely to get

- a number less than 3 on the dice
- or a number greater than 5 on the spinner?

You must show all your working.

$$\frac{2}{6} - \frac{3}{8} = -\frac{1}{24}$$

The numbers 1 and 2 are less than 3 on the dice, so 2 out of the 6 numbers are less than 3 and therefore the probability of getting a number less than 3 on the dice is  $\frac{2}{6}$ . The numbers 6, 7 and 8 are greater than 5 on the spinner, so 3 out of the 8 numbers are greater than 5 and therefore the probability of getting a number greater than 5 on the spinner is  $\frac{3}{8}$ . Subtracting the  $\frac{3}{8}$  from the  $\frac{2}{6}$  gives a negative result meaning that the  $\frac{3}{8}$  is greater and therefore more likely.

A number greater than 5 on the spinner

(Total for Question 15 is 3 marks)

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16 Paulo drives at an average speed of 56 km/h for 1 hour 45 minutes.

Work out the distance Paulo drives.

$$s^d_t$$

Writing the formula triangle for distance, speed, time

$$56 \times 1^45$$

From the formula triangle, distance = speed x time. Multiplying the speed by the time as a sexagesimal works out the distance

.....98..... km

(Total for Question 16 is 3 marks)



17 There are 3 cinemas A, B and C.

The mean number of seats per cinema is 380

There are 350 seats in cinema A.

There are 250 seats in cinema B.

Work out the number of seats in cinema C.

$m^t n$

Writing the formula triangle for mean, total, number

$380 \times 3$

From the formula triangle, total = mean x number. The mean is 380 and the number is 3 as there are 3 cinemas. So the total number of seats in all 3 cinemas is 1140

$1140 - 350 - 250$

Subtracting the number of seats in cinema A and cinema B from the total number of seats leaves the number of seats in cinema C

540

(Total for Question 17 is 4 marks)



18 Asha buys 180 cans of cola.

The cans are sold in packs.  
There are 12 cans in each pack.  
Each pack costs £3

(a) Work out the total cost of the cola Asha buys.

$180 \div 12$  ← Dividing the 180 cans by the 12 in each pack works out that Asha buys 15 packs

$15 \times 3$  ← Multiplying the 15 packs by the £3 cost of each pack works out the total cost

£ ..... 45 .....  
(3)

Ethan buys a box of 24 cans of lemonade for £7  
There are 330 ml of lemonade in each can.

(b) Work out the cost of 100 ml of lemonade.  
Give your answer correct to the nearest penny.

$330 \times 24$  ← This works out that the total volume of 24 cans is 7920 ml

$7920 \div 100$  ← Dividing the 7920 ml by the 100 ml works out that Ethan buys 79.2 lots of 100 ml

$700 \div 79.2$  ← Converting the £7 to pence by multiplying it by 100 to give 700p.  
Dividing this by the 79.2 works out the cost of 100 ml in pence

The answer of 8.8... is rounded to the nearest penny

..... 9 .....p  
(3)

(Total for Question 18 is 6 marks)



19 240 people work at a factory.

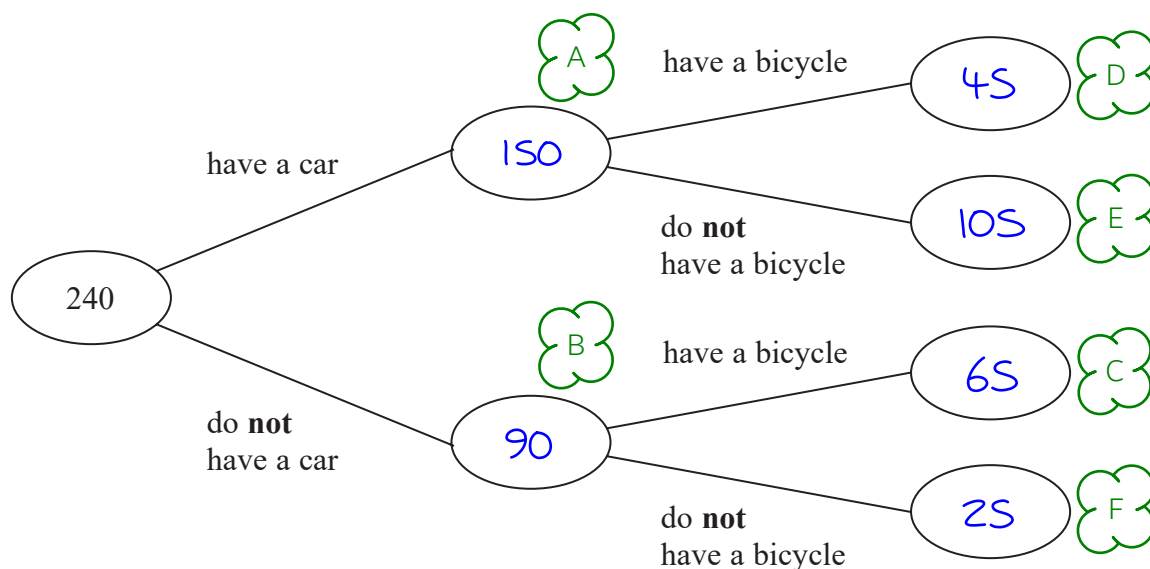
Of these people

150 have a car

110 have a bicycle

65 of the people who have a bicycle do **not** have a car.

(a) Use this information to complete the frequency tree.



See bottom of page for explanations

(3)

(b) What percentage of the 150 people who have a car also have a bicycle?

$$\frac{45}{150} \times 100$$

45 out of the 150 who had a car also had a bicycle. Expressing this as a fraction then multiplying it by 100 to convert it into a percentage

..... 30 .....

(2)

(Total for Question 19 is 5 marks)

- A: 150 have a car  
 B:  $240 - 150 = 90$   
 C: 65 of the people who have a bicycle do not have a car  
 D: 110 have a bicycle and  $110 - 65 = 45$   
 E:  $150 - 45 = 105$   
 F:  $90 - 65 = 25$

20 (a) Work out the value of  $\frac{25 - \sqrt{43.87}}{6 + 2.1^2}$

Write down all the figures on your calculator display.

Typing it all in to the calculator exactly as it is above

1.76527923

(2)

(b) Work out the value of the reciprocal of 0.625

Reciprocal means '1 over'.  $1/0.625 = 1.6$

1.6

(1)

(Total for Question 20 is 3 marks)

21 Write 60 as a product of its prime factors.

The calculator can be used to give a number as a product of its prime factors

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

(Total for Question 21 is 2 marks)

22 There are 48 counters in a bag.  
There are only red counters and blue counters in the bag.

$$\text{number of red counters} : \text{number of blue counters} = 1 : 2$$

Helen has to work out how many red counters are in the bag.

She says,

“There are 24 red counters in the bag because 1 is half of 2 and 24 is half of 48”

Is Helen correct?

You must give a reason for your answer.

No,  $\frac{1}{3}$  are red

There are 3 parts in total in the ratio. 1 out of these 3 are for red. So the fraction which are red is  $\frac{1}{3}$ . She has worked out  $\frac{1}{2}$  of the total

(Total for Question 22 is 1 mark)

23  $-2 \leq n < 5$

$n$  is an integer.

(a) Write down the greatest possible value of  $n$ .

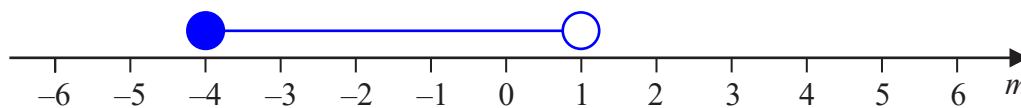
$n$  must be less than 5. An integer means that it is not a decimal or fraction

4

(1)

(b) On the number line below, show the inequality  $-4 \leq m < 1$

The shaded circle means that it can be equal to the  $-4$  it is above. The unshaded circle means that it cannot be equal to the  $1$  it is above



(2)

(c) Solve  $\frac{2}{5}g - 4 < 6$

$\frac{2}{5}g < 10$

Adding 4 to both sides eliminates the  $-4$  on the left and gets the  $g$  term on its own

$g < 10 \div \frac{2}{5}$

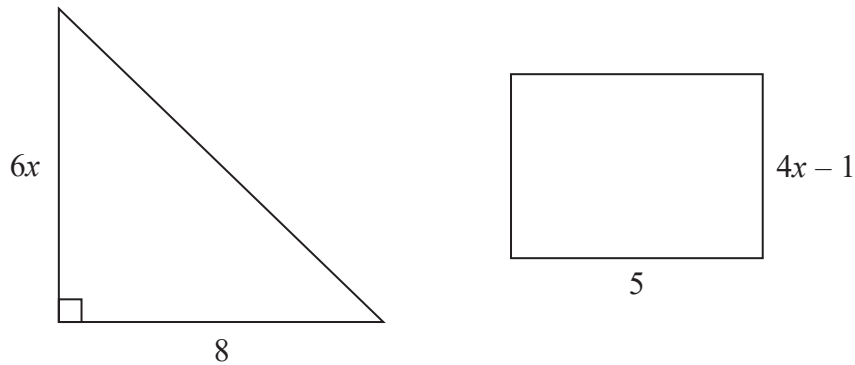
Dividing both sides by  $\frac{2}{5}$  eliminates the  $\frac{2}{5}$  on the left and gets  $g$  on its own

$g < 25$

(3)

(Total for Question 23 is 6 marks)

24 Here is a triangle and a rectangle.



All measurements are in centimetres.

The area of the triangle is  $10 \text{ cm}^2$  greater than the area of the rectangle.

Work out the value of  $x$ .

$$\frac{1}{2} \times 8 \times 6x - 10 = 5(4x - 1)$$

Area of triangle =  $\frac{1}{2} \times \text{base} \times \text{height}$ . The base is 8 and the height is  $6x$ . Subtracting 10 from this makes it equal to the area of the rectangle. Area of rectangle = length  $\times$  width. The length is 5 and the width is  $4x - 1$

$$24x - 10 = 20x - 5$$

Simplifying and expanding the brackets.  $\frac{1}{2} \times 8 = 4$  then  $4 \times 6x = 24x$

$$4x - 10 = -5$$

Subtracting  $20x$  from both sides to get all the  $x$  on the same side

$$4x = 5$$

Adding 10 to both sides to eliminate the  $-10$  on the left and get the  $x$  term on its own

Dividing both sides by 4 eliminates the 4 on the left and gets  $x$  on its own

$$x = \dots 1.25 \dots$$

(Total for Question 24 is 4 marks)

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25 Last year a family recycled 800 kg of household waste.  
57% of this waste was paper and glass.

$$\text{weight of paper recycled} : \text{weight of glass recycled} = 12 : 7$$

Calculate the weight of glass the family recycled.

$12 + 7$

This works out that there are 19 parts in total in the ratio

$57 \div 19$

The 19 parts represent the 57%. So dividing the 57% by the 19 parts works out that 1 part of the ratio represents 3%

$3 \times 7$

Multiplying the value of 1 part of the ratio by the 7 parts which represent the glass works out that 21% of the waste was glass

$\frac{21}{100} \times 800$

Putting the 21% over 100 converts it into a fraction, which when multiplied by the 800 kg finds 21% of the 800 kg and therefore the weight of the glass recycled

..... 168 ..... kg

(Total for Question 25 is 3 marks)



- 26 A number,  $d$ , is rounded to 1 decimal place.  
The result is 12.7

Complete the error interval for  $d$ .

$$12.7 \pm \frac{0.1}{2}$$

Adding and subtracting half of the resolution to the 12.7 works out the upper and lower bound. The resolution is 0.1 as this is what the 1st decimal place goes up in

$$12.65 \leq d < 12.75$$

(Total for Question 26 is 2 marks)

- 27 Tamsin buys a house with a value of £150 000  
The value of Tamsin's house increases by 4% each year.

Rachel buys a house with a value of £160 000  
The value of Rachel's house increases by 1.5% each year.

At the end of 2 years, whose house has the greater value?  
You must show how you get your answer.

$$150000 \times \left(\frac{100+4}{100}\right)^2 = 162240$$

This shows that the value of Tamsin's house is £162240 after 2 years. Adding the 4% to 100% expresses the percentage it increases to each year. Putting this percentage over 100 converts it into a fraction, which when the £150000 is multiplied by it is increased by 4%. Raising the fraction to the power of 2 as it needs to be increased by 4% 2 times

$$160000 \times \left(\frac{100+1.5}{100}\right)^2 = 164836$$

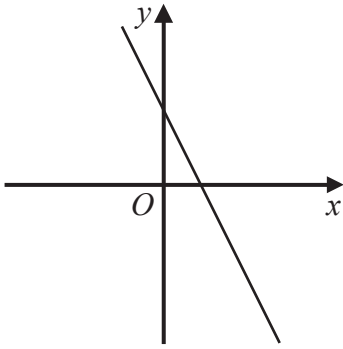
This shows that the value of Rachel's house is £164836 after 2 years. Adding the 1.5% to 100% expresses the percentage it increases to each year. Putting this percentage over 100 converts it into a fraction, which when the £160000 is multiplied by it is increased by 1.5%. Raising the fraction to the power of 2 as it needs to be increased by 1.5% 2 times

Rachel's

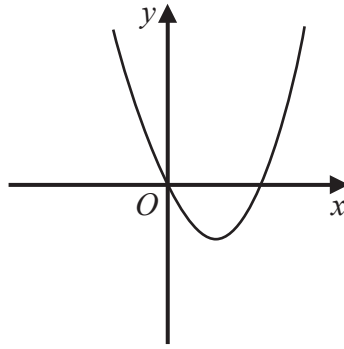
£164836 is more than £162240

(Total for Question 27 is 4 marks)

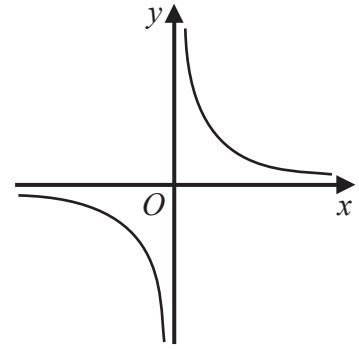
28 Here are five graphs.



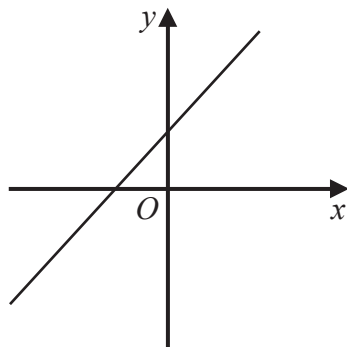
A



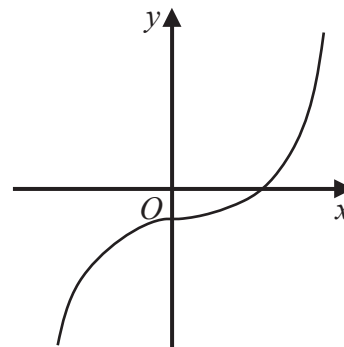
B



C



D



E

The table shows the equations of these graphs.

Equation	Graph
$y = x^2 - 4x$	B
$y = x + 3$	D
$y = x^3 - 2$	E
$y = \frac{1}{x}$	C
$y = 5 - 2x$	A

Match the letter of each graph with its equation.

(Total for Question 28 is 3 marks)

**TOTAL FOR PAPER IS 80 MARKS**

These are all typical graphs. For the straight line graphs the form of  $y = mx + c$  can be used.  $y = x + 3$  has a gradient of 1 so is a positive gradient and must be D. Table mode could be used on the calculator to create a table of values for each equation from -5 to 5 with a step of 1 to work out which graph is which