

Write your name here

Surname

Other names

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

Centre Number

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Candidate Number

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# Mathematics

## Paper 2 (Calculator)

**Foundation Tier**

Thursday 8 June 2017 – Morning  
**Time: 1 hour 30 minutes**

Paper Reference

**1MA1/2F**

**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  $\pi$  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.
- 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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**.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 (a) Simplify  $5p - 3p + p$

$$\begin{array}{r} 3p \\ \hline (1) \end{array}$$

(b) Simplify  $m^3 + m^3$

$$\begin{array}{r} 2m^3 \\ \hline (1) \end{array}$$

(c) Simplify  $10 + 3c + 5d - 7c + d$

All like terms can be collected and added/subtracted.

$$\begin{array}{r} 10 - 4c + 6d \\ \hline (2) \end{array}$$

(Total for Question 1 is 4 marks)

2 Write 56.78 correct to one significant figure.

5 is the 1st significant figure. The 2nd significant figure is a 6 so this means the 1st should round up.

$$\begin{array}{r} 60 \\ \hline \end{array}$$

(Total for Question 2 is 1 mark)

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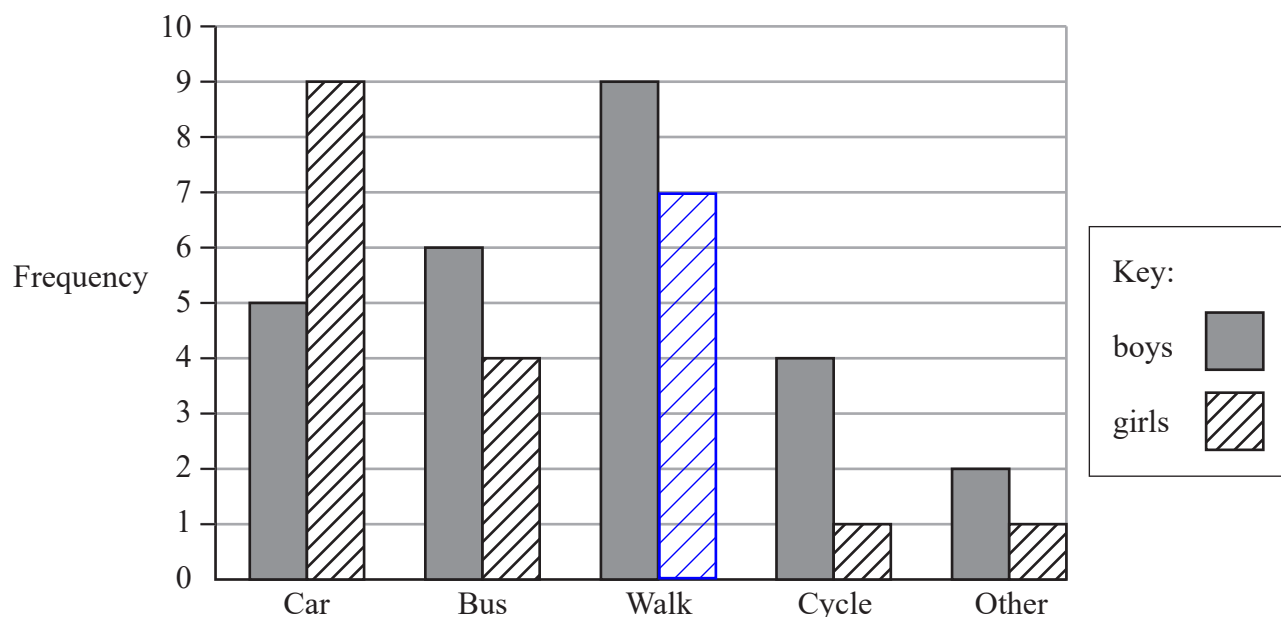
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3 A teacher asks the students in Year 6 what type of transport they use to get to school. The dual bar chart shows some of the results.



(a) What is the most popular type of transport used by the boys?

Boys are represented by the dark grey bars. 9 walk and this is the highest frequency.

Walk

(1)

7 girls walk to school.

(b) Show this information on the dual bar chart.

(1)

More of the students get to school by car than by bus.

(c) How many more?

$5 + 9 = 14$  students go by Car.  
 $6 + 4 = 10$  students go by Bus.  
14 is 4 more than 10.

4

(1)

The number of students in Year 5 is the same as the number of students in Year 6

(d) What is the total number of students in Years 5 and 6?

$5 + 9 + 6 + 4 + 9 + 7 + 4 + 1 + 2 + 1 = 48$

$48 \times 2$

Calculate the total number of students in Year 6 from the frequencies on the graph. Then multiply this by 2 as there are the same number in Year 5.

96

(2)

(Total for Question 3 is 5 marks)

4 Here are four fractions.

$$\frac{2}{5} = \frac{12}{30} \quad \frac{11}{30} \quad \frac{1}{2} = \frac{15}{30} \quad \frac{7}{15} = \frac{14}{30}$$

Write these fractions in order of size.  
Start with the smallest fraction.

Convert all the fractions so that  
the denominators are the same  
and they can be compared.

$$\frac{11}{30}, \frac{2}{5}, \frac{7}{15}, \frac{1}{2}$$

(Total for Question 4 is 2 marks)

5 David sells CDs in a shop.

The tally chart shows information about the number of CDs David sold on Monday, on Tuesday and on Wednesday.

	Tally	Frequency
Monday		12
Tuesday		18
Wednesday		8

(a) Write down **one** thing that is wrong with the tally chart.

The frequency and tally for Monday don't match.

(1)

David drew this pictogram to show the information for Tuesday and Wednesday.

Tuesday	⊙ ⊙ ⊙ ⊙ ⊙
Wednesday	⊙ ⊙ ⊙

Key: ⊙ represents 3 CDs

(b) Write down **one** thing that is wrong with this pictogram.

Half of a CD isn't possible.

Wednesday represents 7.5 according to the pictogram.

(1)

(Total for Question 5 is 2 marks)

6 There are 495 coins in a bottle.

$\frac{1}{3}$  of the coins are £1 coins.

124 of the coins are 50p coins.

The rest of the coins are 20p coins.

Work out the total value of the 495 coins.

$$\frac{1}{3} \times 495 = 165$$

The number of £1 coins.  
They are worth £165.

$$124 \times 0.5 = 62$$

The worth of 124  
lots of 50p.

$$495 - 165 - 124 = 206$$

The number of  
20p coins.

$$206 \times 0.2 = 41.2$$

The worth of 206  
lots of 20p.

$$165 + 62 + 41.2$$

The total worth  
of the coins.

£ 268.20

(Total for Question 6 is 4 marks)

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7 The probability that a new fridge has a fault is 0.015

What is the probability that a new fridge does **not** have a fault?

$1 - 0.015$

0.985

(Total for Question 7 is 1 mark)

8 Here is a list of numbers.

21 22 23 24 25 26 27 28 29

(a) From the numbers in the list, write down a square number.

$5^2 = 25$

25

(1)

(b) From the numbers in the list, write down a number that is a multiple of **both** 4 and 6

24 is a multiple of both as  $4 \times 6 = 24$

24

(1)

(c) Write down all the prime numbers in the list.

The rest of the numbers are divisible by 2 or appear in the times tables.

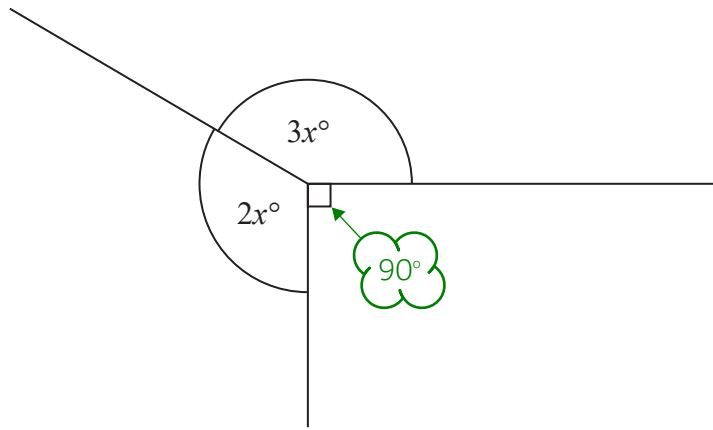
23, 29

(1)

(Total for Question 8 is 3 marks)



9



Find the value of  $x$ .

$$360 - 90 = 270$$

There are  $360^\circ$  in total around a point. This leaves the  $2x$  and  $3x$ .

$$5x = 270$$

$$2x + 3x = 5x$$

$$x = \frac{270}{5}$$

54

(Total for Question 9 is 3 marks)

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10 Suha is going to buy 150 envelopes.

Here is some information about the cost of envelopes in two shops.

**Letters2send**  
Pack of 25 envelopes for £3.49

**Stationery World**  
Pack of 10 envelopes for £2.10  
Buy 2 packs get 1 pack free

Suha wants to buy the envelopes as cheaply as possible.

Which shop should Suha buy the 150 envelopes from?

You must show how you get your answer.

$$\frac{150}{25} = 6$$

← 6 lots of 25 are needed to get 150 envelopes.

$$6 \times 3.49 = \pounds 20.94$$

← The cost for getting them from Letters2send.

$$\frac{150}{30} = 5$$

← 2 packs and the free pack get 30 envelopes. 5 lots are needed.

Only 2 of the 3 packs are paid for per 30 for Stationery World.

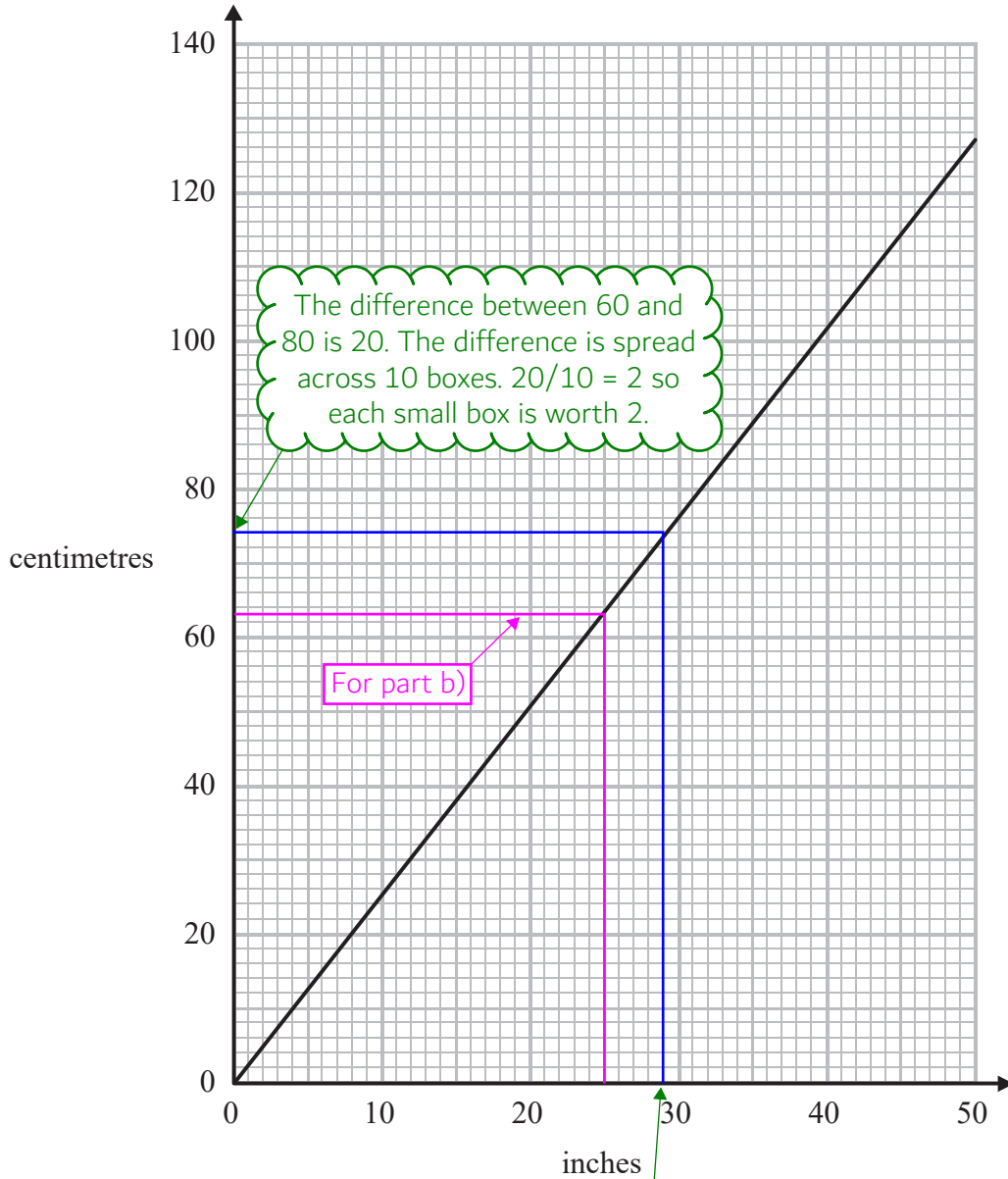
$$5 \times 2 \times 2.10 = \pounds 21$$

← The cost for getting them from Stationery World.

Letters2send

(Total for Question 10 is 4 marks)

11 You can use this graph to change between inches and centimetres.



(a) Change 74 cm to inches.

The difference between 20 and 30 is 10. The difference is spread across 10 boxes.  $10/10 = 1$  so each small box is worth 1.

..... 29 ..... inches  
(1)

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Daniel's height is 6 feet 3 inches.

1 foot = 12 inches

(b) What is Daniel's height in centimetres?

$$6 \times 12 + 3 = 75$$

Converting the feet into inches then adding the 3 inches to get the total height in inches.

$$3 \times 63$$

75 inches can't be read off the graph. However we can read off for 25 inches, which roughly converts to 63cm, then multiply by 3.

189

centimetres

(3)

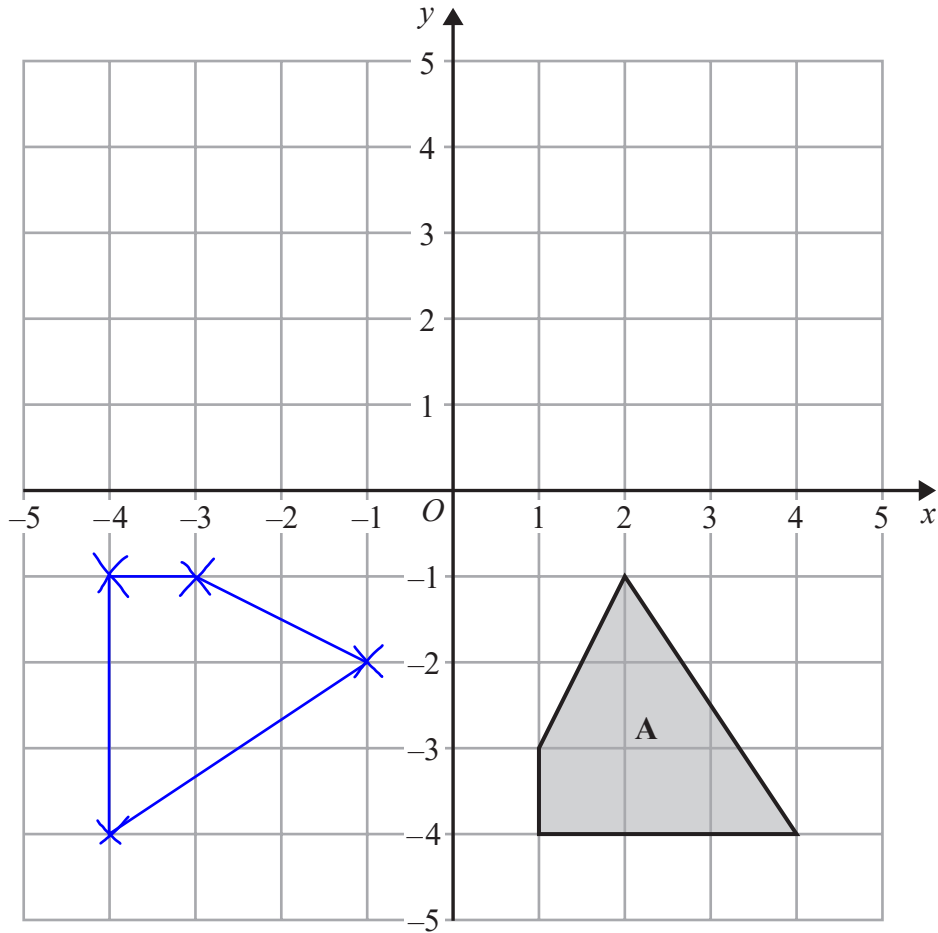
(Total for Question 11 is 4 marks)

12 Find the value of  $\frac{\sqrt{13.4 - 1.5}}{(6.8 + 0.06)^2}$

Write down all the figures on your calculator display.

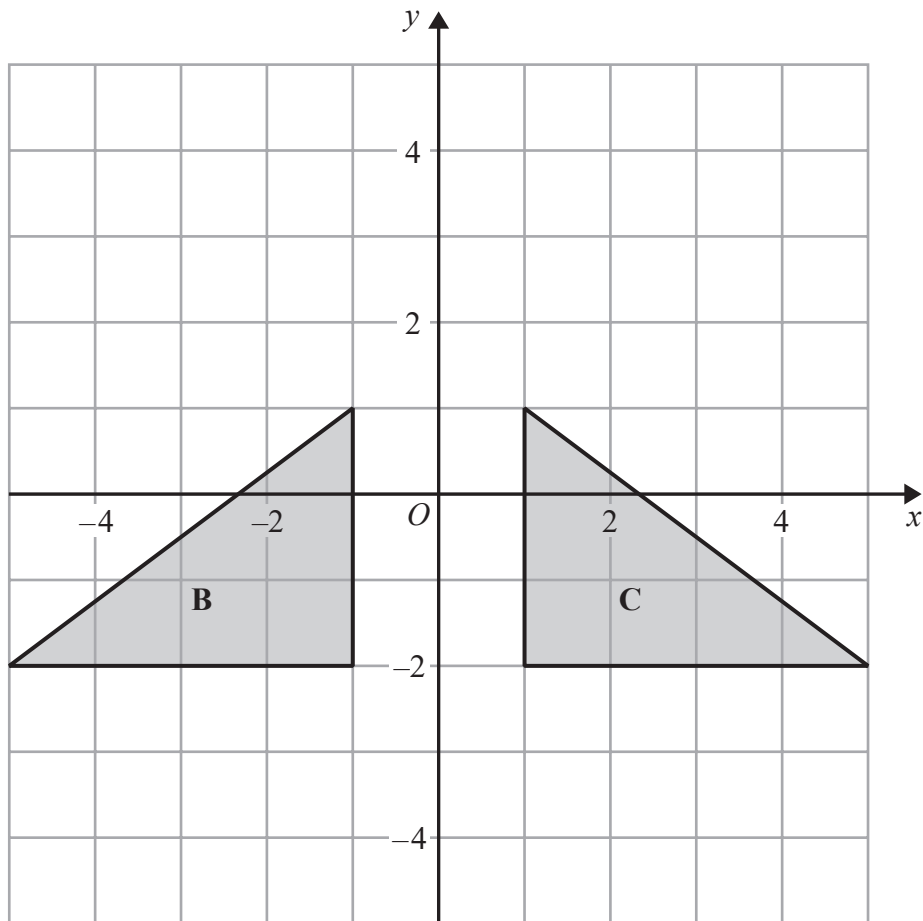
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(Total for Question 12 is 2 marks)



(a) Rotate shape A  $90^\circ$  clockwise about centre  $O$ .

(2)



(b) Describe fully the single transformation that maps triangle **B** onto triangle **C**.

Reflection on the y-axis

(2)

(Total for Question 13 is 4 marks)

14 (a) Factorise  $5 - 10m$

5 is the highest common factor  
so this is taken out of the bracket.

$$5(1-2m)$$

(1)

(b) Factorise fully  $2a^2b + 6ab^2$

2,  $a$  and  $b$  are the highest  
common factors so these are  
taken out of the bracket.

$$2ab(a+3b)$$

(2)

(Total for Question 14 is 3 marks)

15 (a) Write  $4.7 \times 10^{-1}$  as an ordinary number.

Divide by  
10 once.

$$0.47$$

(1)

(b) Work out the value of  $(2.4 \times 10^3) \times (9.5 \times 10^5)$   
Give your answer in standard form.

Putting all of this in to the calculator then  
pressing ENG converts it into standard form  
(to the nearest multiple of 3 power of ten).

Otherwise count how many times the  
ordinary number has to be divided by 10 to  
get a decimal between 1 and 10 and multiply  
by 10 to the power of the number of times.

$$2.28 \times 10^9$$

(2)

(Total for Question 15 is 3 marks)

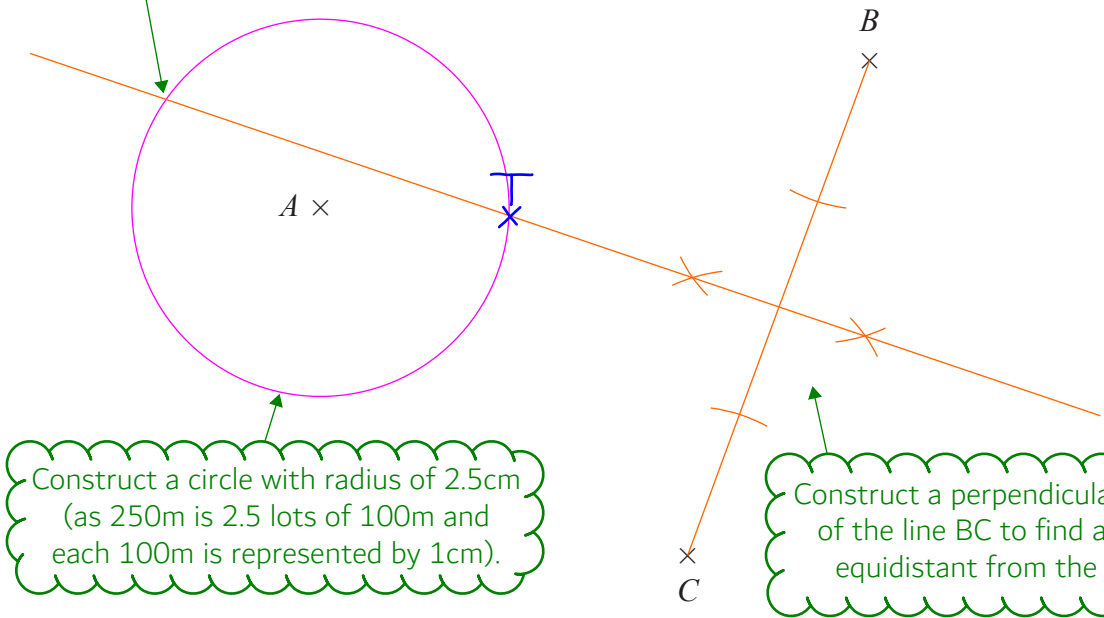
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16  $A$ ,  $B$  and  $C$  are three points on a map.

T could also go here but it only asks for one possible position



Construct a circle with radius of 2.5cm (as 250m is 2.5 lots of 100m and each 100m is represented by 1cm).

Construct a perpendicular bisector of the line BC to find all points equidistant from the points.

1 cm represents 100 metres.

Point  $T$  is 250 metres from point  $A$ .

Point  $T$  is equidistant from point  $B$  and point  $C$ .

On the map, show one of the possible positions for point  $T$ .

(Total for Question 16 is 3 marks)



17 The table shows the probabilities that a biased dice will land on 2, on 3, on 4, on 5 and on 6

Number on dice	1	2	3	4	5	6
Probability		0.17	0.18	0.09	0.15	0.1

Neymar rolls the biased dice 200 times.

Work out an estimate for the total number of times the dice will land on 1 or on 3

$$1 - 0.17 - 0.09 - 0.15 - 0.1 = 0.49$$

$$0.49 \times 200$$

Multiplying the probability by the total frequency gives an estimate for the number of times it will land on a 1 or 3.

Subtracting the probabilities for 2, 4, 5 and 6 leaves us with the probability of 1 or 3.

98

(Total for Question 17 is 3 marks)

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- 18 On Saturday, some adults and some children were in a theatre.  
The ratio of the number of adults to the number of children was 5 : 2

Each person had a seat in the Circle or had a seat in the Stalls.

$\frac{3}{4}$  of the children had seats in the Stalls.

117 children had seats in the Circle.

There are exactly 2600 seats in the theatre.

On this Saturday, were there people on more than 60% of the seats?  
You must show how you get your answer.

$$0.6 \times 2600 = 1560$$

Multiplying by 0.6 finds 60% of the total number of seats so tells us how many people would be needed for the condition to be met.

$$\frac{117 \times 4}{2} \times 7 = 1638$$

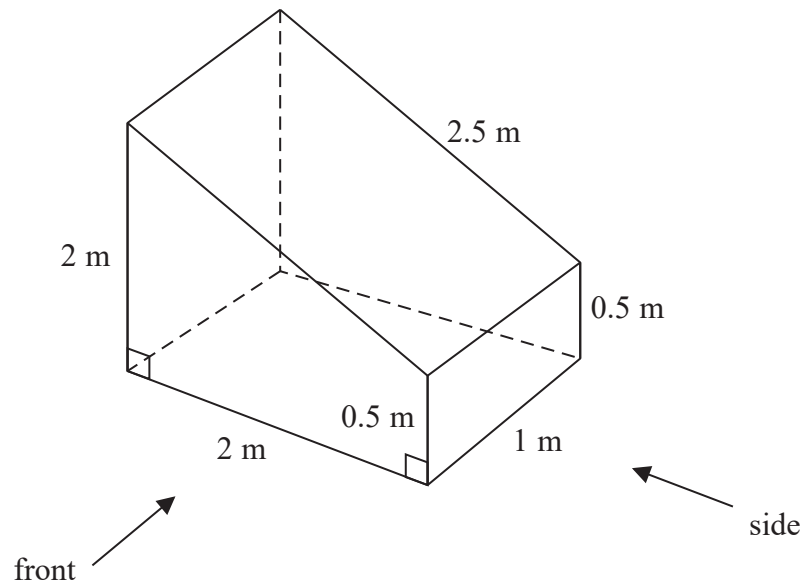
117 must be a quarter of the children so multiplying by 4 gives the total number. This is represented by 2 parts in the ratio so if we divide by 2 this tells us the value of 1 part. Multiplying by 7 (as there are 7 parts in the ratio in total) gives the total number of people on the seats.

Yes

1638 people were in the seats and this is greater than 1560, which is the minimum needed to fill 60% so the conditions have been met.

(Total for Question 18 is 5 marks)

19 The diagram shows a prism with a cross section in the shape of a trapezium.



On the centimetre grid below, draw the front elevation and the side elevation of the prism.  
Use a scale of 2 cm to 1 m.

If 1m is represented by 2cm, 2m must be represented by 4cm, 0.5m by 1cm. Front elevation removes the width, side elevation removes the length.

(Total for Question 19 is 4 marks)

20 Olly drove 56 km from Liverpool to Manchester.  
He then drove 61 km from Manchester to Sheffield.

Olly's average speed from Liverpool to Manchester was 70 km/h.  
Olly took 75 minutes to drive from Manchester to Sheffield.

(a) Work out Olly's average speed for his total drive from Liverpool to Sheffield.

$$S = \frac{d}{t} = \frac{56 + 61}{\frac{75}{60} + \frac{56}{70}}$$

km/h : this means divide distance in km by time in hours. The units tell us what to do.

Adding the distances gives the total distance. Dividing 75 by 60 converts the minutes into hours. Time for Liverpool to Manchester = distance/speed. Adding both of the times for the separate journeys together gives the total amount of time taken for the whole journey.

..... 57.1 ..... km/h  
(4)

Janie drove from Barnsley to York.

Janie's average speed from Barnsley to Leeds was 80 km/h.  
Her average speed from Leeds to York was 60 km/h.

Janie says that the average speed from Barnsley to York can be found by working out the mean of 80 km/h and 60 km/h.

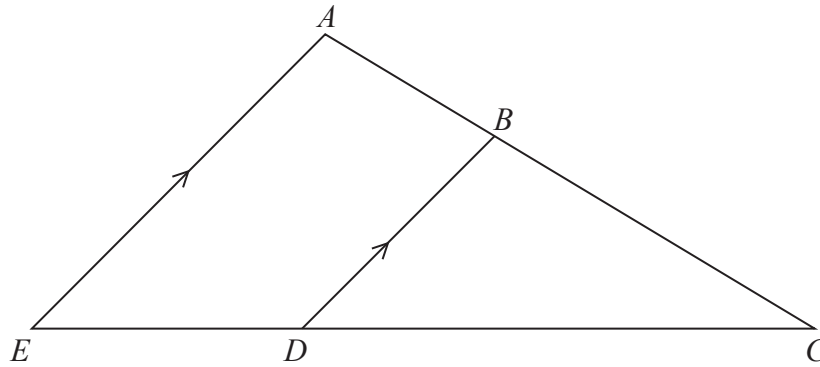
(b) If Janie is correct, what does this tell you about the two parts of Janie's journey?

Both journeys must have taken the same amount of time.

(1)

If she went 80km/h for a longer duration than 60km/h, the average would be closer to 80 than 60.

(Total for Question 20 is 5 marks)



*ABC* and *EDC* are straight lines.

*EA* is parallel to *DB*.

*EC* = 8.1 cm.

*DC* = 5.4 cm.

*DB* = 2.6 cm.

(a) Work out the length of *AE*.

$$2.6 \times \frac{8.1}{5.4}$$

5.4 multiplied by the scale factor gives 8.1. So  $8.1/5.4$  gives the scale factor.

The triangles *ACE* and *BCD* are similar as all the angles are the same. *ACE* is a scaled up version of *BDC*. We need to multiply 2.6 by the scale factor as this is the corresponding side to *AE*.

3.9

(2)

cm

*AC* = 6.15 cm.

(b) Work out the length of *AB*.

$$6.15 - \frac{6.15}{\left(\frac{8.1}{5.4}\right)}$$

Dividing the longer side, *AC*, by the scale factor gives the shorter corresponding side, *BC*.

$AB = AC - BC$

2.05

(2)

cm

(Total for Question 21 is 4 marks)

22 Anil wants to invest £25 000 for 3 years in a bank.

**Personal Bank**  
Compound Interest  
2% for each year

**Secure Bank**  
Compound Interest  
4.3% for the first year  
0.9% for each extra year

Which bank will give Anil the most interest at the end of 3 years?  
You must show all your working.

$$25000 \times 1.02^3 = \cancel{26530.20}$$

Multiplying by 1.02 increases the original amount by 2%. This will be done three times so we can raise to the power of 3.

$$25000 \times 1.043 \times 1.009^2 = \cancel{26546.46}$$

100% + 4.3% = 104.3% so multiplying by 1.043 give the increase of 4.3%. Multiplying by 1.009 twice (to the power of 2) increases the amount by 0.9% for two years.

Secure Bank

(Total for Question 22 is 3 marks)

23 A number,  $n$ , is rounded to 2 decimal places.  
The result is 4.76

Using inequalities, write down the error interval for  $n$ .

The third decimal place will determine whether the second decimal place rounds up or down. If it went lower than 4.755 it would round down to 4.75. If it is as high as 4.765 it would round up to 4.77.

$$4.755 \leq n < 4.765$$

(Total for Question 23 is 2 marks)

24 Solve  $x^2 + 5x - 24 = 0$

$$(x+8)(x-3) = 0$$

either  $x+8 = 0$   
or  $x-3 = 0$

Solve by factorisation. Put two brackets with  $x$  and fill with two numbers which multiply to give  $-24$  and add to give  $5$ .

$$x = -8, x = 3$$

(Total for Question 24 is 3 marks)

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25 Here are the first six terms of an arithmetic sequence.

3            8            13            18            23            28

(a) Find an expression, in terms of  $n$ , for the  $n$ th term of this sequence.

$n$  increases by 1 between each term and the sequence increases by 5 each term. Therefore it must involve  $5n$ . Subtracting 2 from  $5n$  adjusts it to get the sequence.

$$5n - 2$$

(2)

The  $n$ th term of a different sequence is  $3n^2$

Nathan says that the 4th term of this sequence is 144

(b) Is Nathan right?

Show how you get your answer.

$$3 \times 4^2 = 48$$

$n = 4$  in the 4th term. Substitute this into  $3n^2$ .

NO

(1)

(Total for Question 25 is 3 marks)

TOTAL FOR PAPER IS 80 MARKS