Write your name here

| Surname | Other names |
|---|---|
| | |

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

Centre Number | | | | | |

Candidate Number | | | | |

# 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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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

**.CG Maths.**

**Answer ALL questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

**1** (a) Simplify $5p - 3p + p$

.....

**(1)**

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

.....

**(1)**

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

All like terms can be collected and added/subtracted.

.....

**(2)**

**(Total for Question 1 is 4 marks)**

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**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...

.....

**(Total for Question 2 is 1 mark)**

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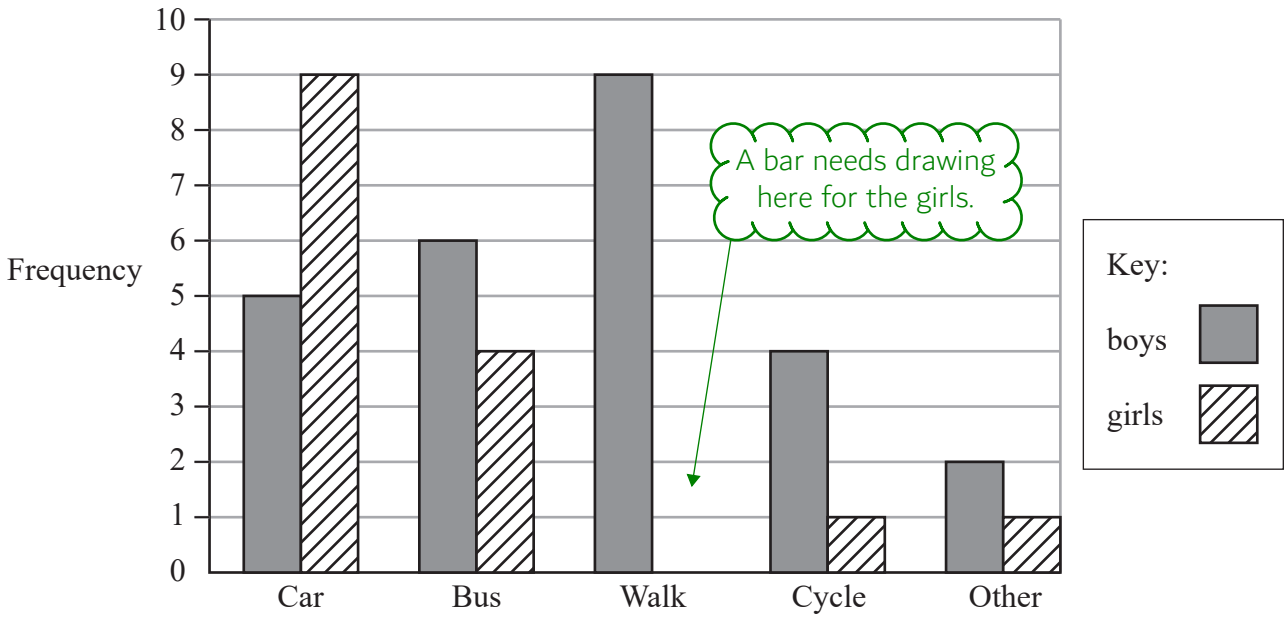
**3** A teacher asks the students in Year 6 what type of transport they use to get to school.
The dual bar chart shows some of the results.




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

Boys are represented by the dark grey bars. Which is the highest frequency?

.....

**(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?

Add up both the girls and boys for the Car and for the Bus. How many more is the total for the Car?

.....

**(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?

Calculate the total number of students in Year 6 from the frequencies on the graph. There are the same number in Year 5.

.....

**(2)**

**(Total for Question 3 is 5 marks)**

**4** Here are four fractions.

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

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. Multiply the denominator and numerator by the same number when converting to equivalent fractions.

.....

**(Total for Question 4 is 2 marks)**

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**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** | 𝍸 𝍸 \|\|\| | 12 |
| **Tuesday** | 𝍸 𝍸 𝍸 \|\|\| | 18 |
| **Wednesday** | 𝍸 \|\|\| | 8 |

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

There is something wrong with the tallies and frequencies on Monday

**(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.

Work out the frequencies represented in the pictogram. What's wrong with these?

**(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.

Calculate the number of £1 coins, which is the same as they are worth in pounds. Work out the value of the 50p coins in pounds. Calculate the number of 20p coins and then their value in pounds. Add up the values of the £1, 50p and 20p coins to get the total value.

£.....

**(Total for Question 6 is 4 marks)**

**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?

The probability of an event happening or it not happening is certain. So the probabilities add up to 1.

.....

**(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.

$3^2 = 3 \times 3 = 9$, so 9 is a square number. Try squaring numbers to get one on the list if in doubt.

.....

**(1)**

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

e.g. 8 x 8 = 64 and 16 x 4 = 64 so 64 is a multiple of 4, 8 and 16.

.....

**(1)**

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

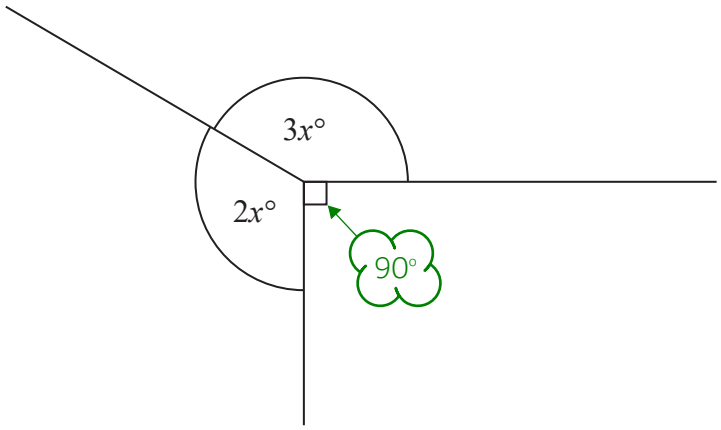
Only divisible by themselves and 1.

.....

**(1)**

**(Total for Question 8 is 3 marks)**

**9**




Find the value of $x$.

There are 360° in total around a point. $2x + 3x = 5x$

.....

**(Total for Question 9 is 3 marks)**

**10** Suha is going to buy 150 envelopes.

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

| **Letters2send** | **Stationery World** |
|---|---|
| Pack of 25 envelopes for £3.49 | Pack of 10 envelopes for £2.10<br>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.

1. Calculate how many packs of 25 are needed from Letters2send.
2. Calculate the cost of these.
3. Two packs and the free pack from Stationary World gets 30 envelopes. Work out how many lots of 30 are needed.
4. Calculate the cost of these. Only 2 packs are paid for per 30 envelopes.
5. Compare the prices and state the cheapest option.

**(Total for Question 10 is 4 marks)**

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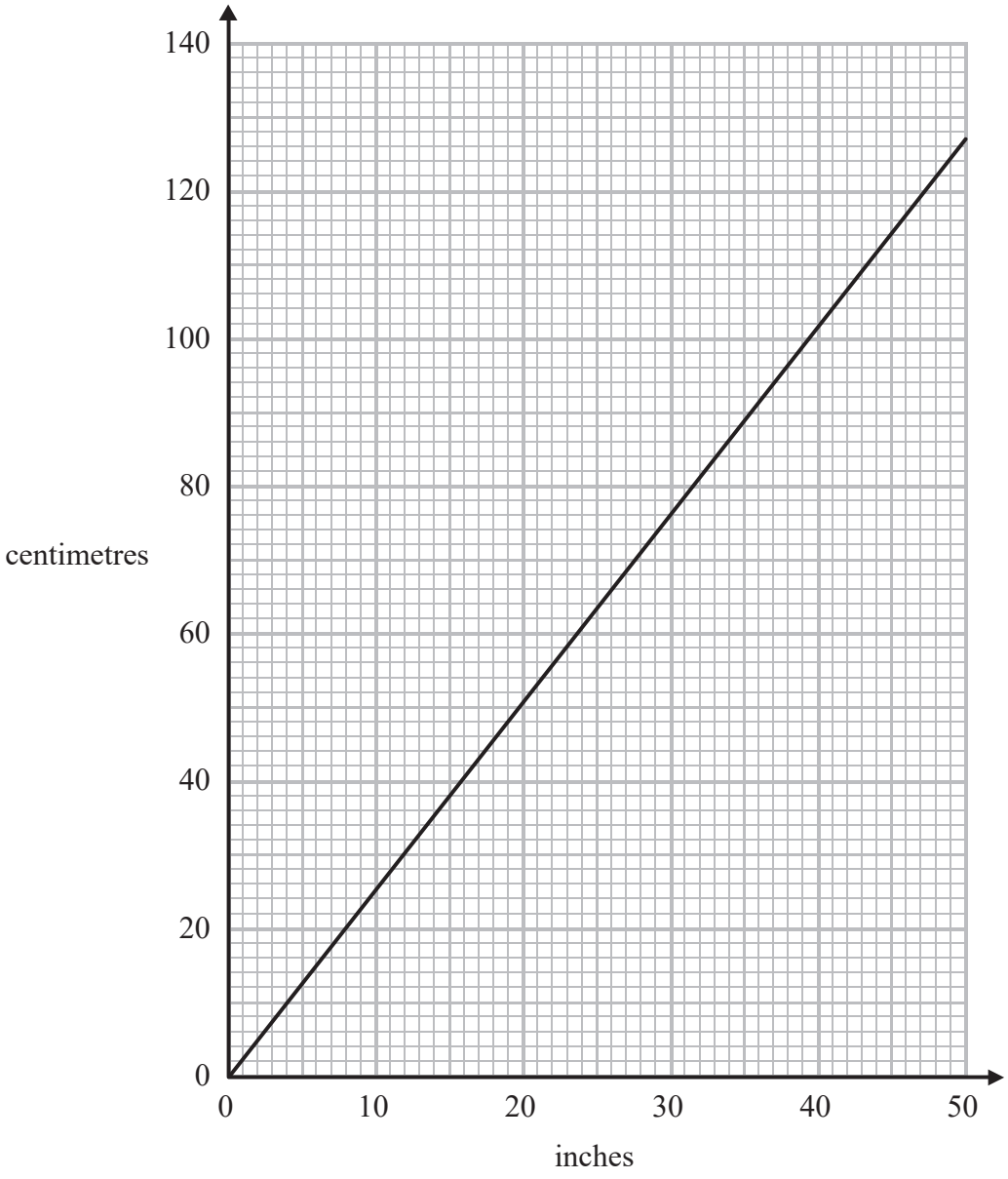
**11** You can use this graph to change between inches and centimetres.




(a) Change 74 cm to inches.

Draw a straight line across from 74 on the *y*-axis then down to the *x*-axis. Read the value off the *x*-axis.

..... inches

**(1)**

Daniel's height is 6 feet 3 inches.

1 foot = 12 inches

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

Convert the feet into inches then add the 3 inches to get the total height in inches. The graph on the previous page can be used to convert however it does not go high enough. A lower conversion will have to be made then scaled up.

..... centimetres

**(3)**

**(Total for Question 11 is 4 marks)**

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

Write down all the figures on your calculator display.

It is easier to press the fraction button first. What you type into the calculator should look exactly like it does above.

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**(Total for Question 12 is 2 marks)**

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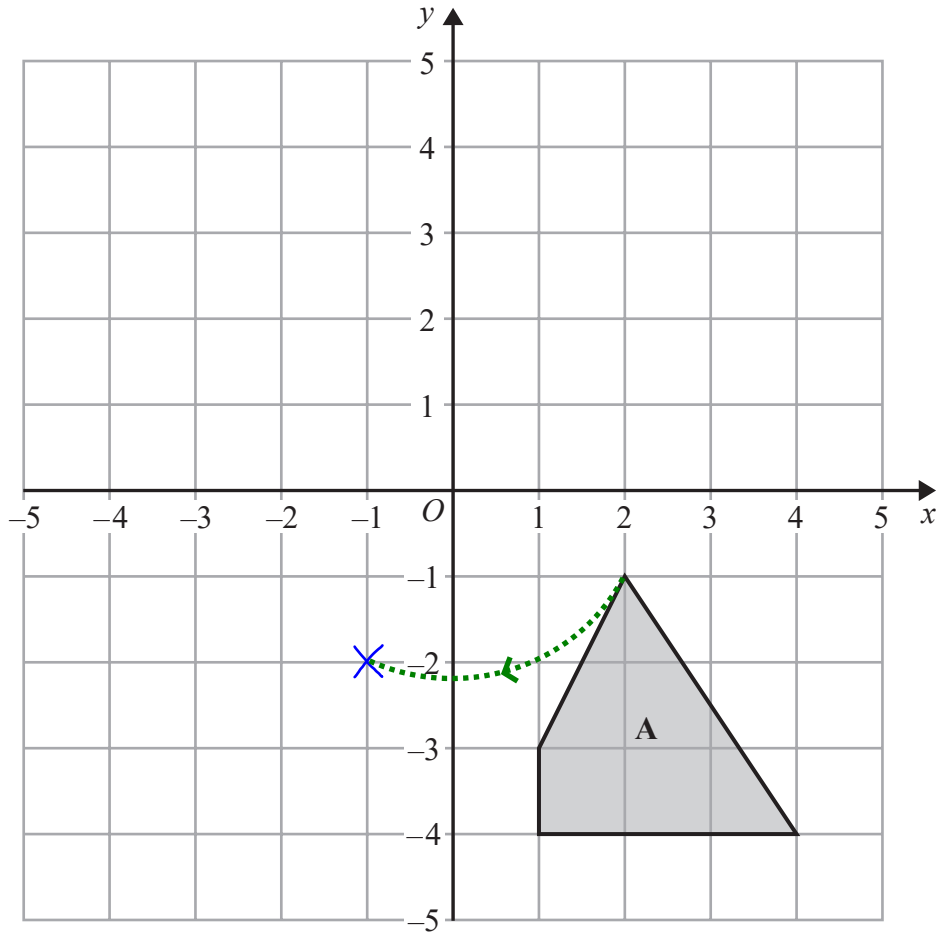
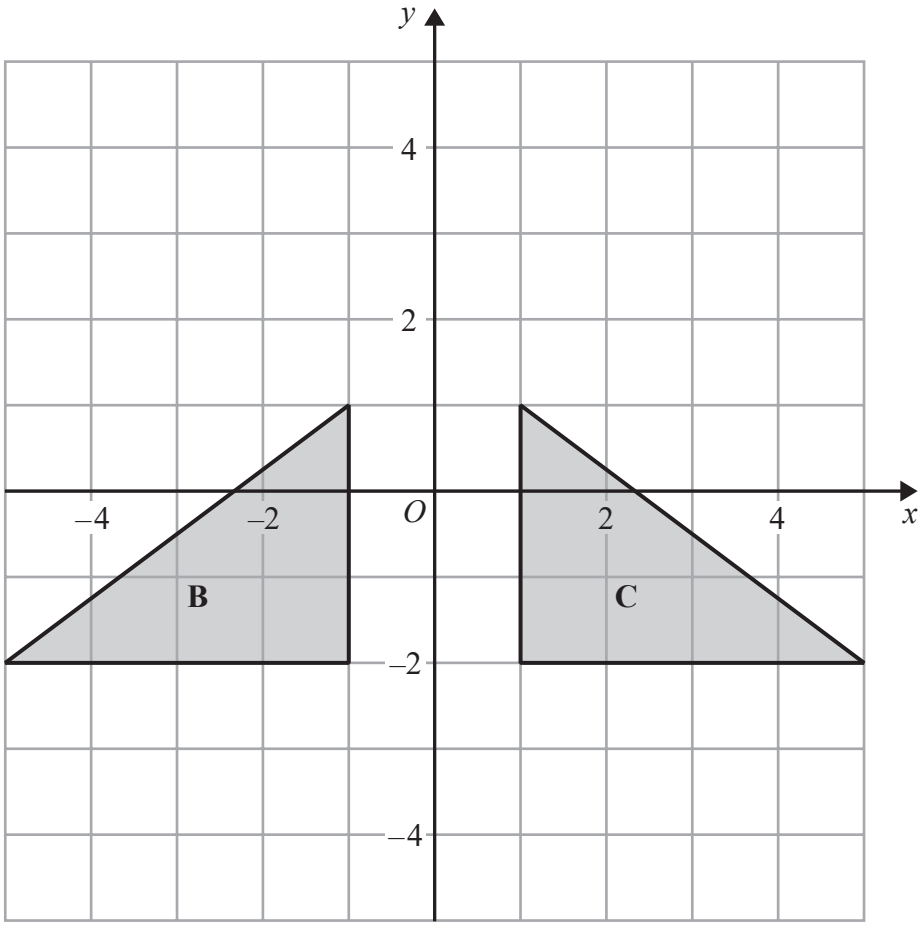
13




(a) Rotate shape **A** 90° clockwise about centre *O*.

**(2)**

Use tracing paper to draw around the shape, put something sharp in at the point (0 , 0) then rotate the paper round to see where it rotates to




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

Its either a translation, reflection, enlargement or rotation

**(2)**

**(Total for Question 13 is 4 marks)**

**14** (a) Factorise $5 - 10m$

Bring the highest common factor out and leave the rest in a bracket which is multiplied by that factor.

.....

**(1)**

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

Bring the highest common factors out and leave the rest in a bracket which is multiplied by those factors.

.....

**(2)**

**(Total for Question 14 is 3 marks)**

---

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

Divide by 10 once.

.....

**(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)**

**(Total for Question 15 is 3 marks)**

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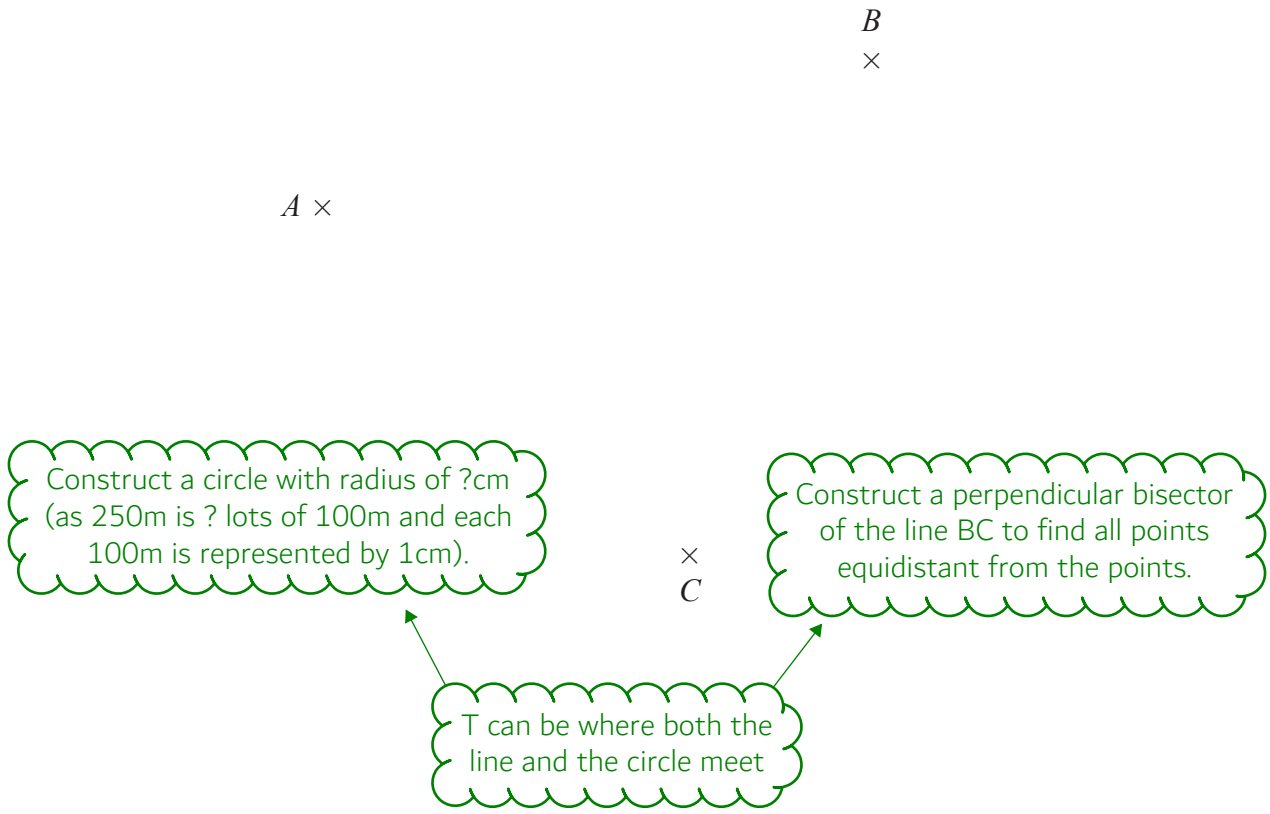
**16** $A$, $B$ and $C$ are three points on a map.




1 cm represents 100 metres.

Point $T$ is 250 metres from point $A$.
Point $T$ is equidistant from point $B$ and point $C$.

Same distance from both points.

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

All the probabilities need to add together to get 1 as it is certain that one of the outcomes will happen. Adding together the probabilities of mutually exclusive events gives the probability of either of them happening. The probability is an estimate for the relative frequency of an outcome.

.....

**(Total for Question 17 is 3 marks)**

**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.

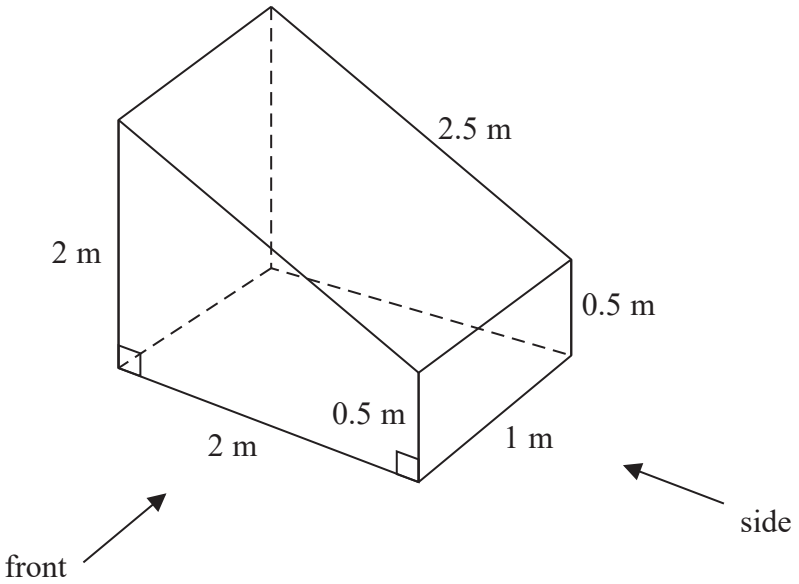
There are exactly 2600 seats in the theatre.

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

We could find 60% of 2600 as this will tell us the minimum number of people needed to meet the conditions or work out the percentage of seats which are filled. We need to work out how many people there are in total on Saturday. The only number given is 117, which must be a quarter of the children. If we know how many children there are in total, who are represented by two parts in the ratio, we can work out how many people there are in total using the ratio.

**(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 ?cm. 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.

$S = \frac{d}{t} =$

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. The 75 minutes needs to be converted into hours (consider that there are 60 minutes in an hour). 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.

..... 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.

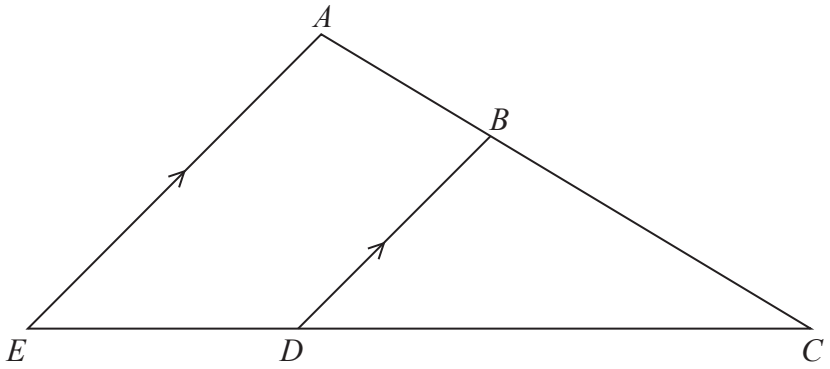
(b) If Janie is correct, what does this tell you about the two parts of Janie's journey?

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

**(1)**

**(Total for Question 20 is 5 marks)**

**21**




*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*.

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. 5.4 multiplied by the scale factor gives 8.1.

..... cm

**(2)**

*AC* = 6.15 cm.

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

6.15 -

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

AB = AC - BC

..... cm

**(2)**

**(Total for Question 21 is 4 marks)**

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

The interest is added at the end of each year and the percentage is of the amount at the end of the previous year.

| **Personal Bank** | **Secure Bank** |
|---|---|
| Compound Interest | Compound Interest |
| 2% for each year | 4.3% for the first year<br>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.

100% + 2% = 102%
What can we multiply 25000 by to increase by 2%?
This needs to be done 3 times as it is compound interest. A similar method needs to be done for Secure bank. We then need to compare the amounts of money (or interest received) at the end of the 3 years in order to conclude which one earned the most.

**(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. What is the lowest it can go without rounding down to 4.75 and the highest it can go without rounding to 4.77?

$\leqslant n <$

**(Total for Question 23 is 2 marks)**

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

$(x \quad )(x \quad ) = 0$

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

Either $x$ = ? or $x$ = ?

.....

**(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 ? each term. Therefore it must involve ?$n$. Subtracting ? from ?$n$ adjusts it to get the sequence.

.....

**(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.

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

**(1)**

**(Total for Question 25 is 3 marks)**

**TOTAL FOR PAPER IS 80 MARKS**