

Surname	Other Names
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Edexcel GCSE

Centre Number				
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Candidate Number			
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Mathematics A

Paper 2 (Calculator)

Higher Tier



Practice Paper 1

Time: 1 hour 45 minutes

Paper Reference

MissB/Edex/H2

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser. 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.*
- **Calculators are allowed.**



Information

- The total mark for this paper is 100
- The marks for **each** question are shown in brackets
 - *Use this as a guide as to how much time to spend on each question.*
- Questions labelled with an asterisk (*) are ones where the quality of your written communication will be assessed.

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.

Teacher	Class
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Overview

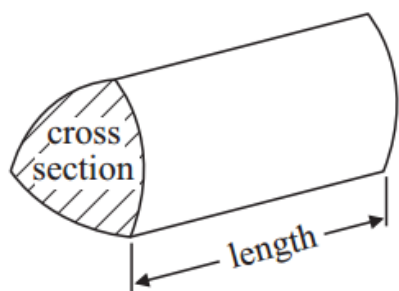
Q	Topic	Your Mark	Total
1	Use of a Calculator		3
2	Conversion - m^2 to cm^2		2
3	Functional Money		4
4	Conversion – Currency		3
5	Transformations – Translation & Rotation		5
6	Proportion		3
7	Sequences		3
8	Straight Line Graph		3
9	Functional Pythagoras' Theorem		4
10	Speed, Distance and Time		3
11	Loci		3
12	Forming & Solving Equations		4
13	Ratio		3
14	Best Buy – Compound & Successive %		4
15	Trial and Improvement		4
16	Reverse Averages		3
17	Bearings – Pythagoras & Trigonometry		4
18	Histogram		7
19	Change the Subject		4
20	Stratified Sample		3
21	Bounds		3
22	Equation of Perpendicular Line		3
23	Solving with the Quadratic Formula		2
24	Algebraic Proof		3
25	Area of Triangle and Cosine Rule		4
26	Recurring Decimal to a Fraction		3
27	Complete the Square		2
28	Volume of a Frustum		4
29	Transformation Graphs		4
	Total		100

GCSE Mathematics

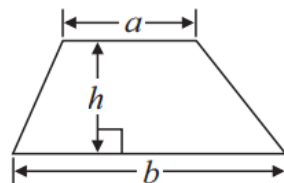
Formulae: Higher Tier

**You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.**

Volume of prism = area of cross section \times length

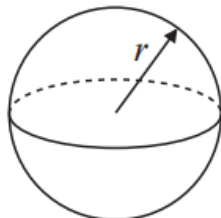


Area of trapezium = $\frac{1}{2}(a + b)h$



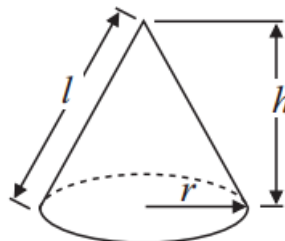
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$

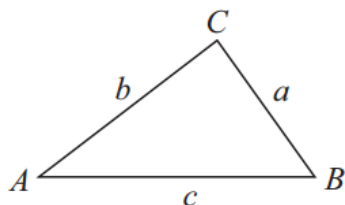


Volume of Cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



In any triangle ABC



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$
where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle = $\frac{1}{2}ab \sin C$

Answer ALL questions

Write your answers in the spaces provided.

You must write down all stages in your working.

Calculators are allowed to be used.

1 $x = -2$

(a) Work out the value of $\frac{\sqrt{9+x^2}}{7.4-x}$

Write down all the figures on your calculator display.

_____ (2)

(b) Write your answer to part (a) correct to 3 significant figures

_____ (1)

(Total for Question 1 is 3 marks)

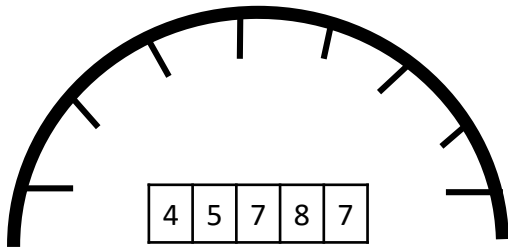
2 The area of a badminton court is $81.74m^2$.
Calculate the area of the court in cm^2 .

_____ cm^2
(2)

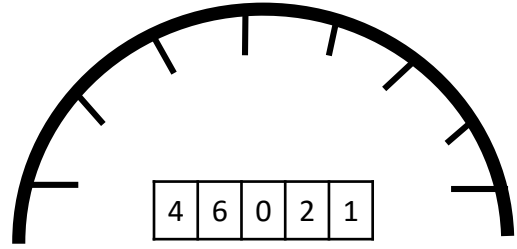
(Total for Question 2 is 2 marks)

3* Millie travels by car to visit Oxford university on an open day.

Millie records the millage readings on her car as evidence.



Before the Journey



After the Journey

As part of a new scheme a college will refund Millie 12.4p for each of the first 50 miles travelled and 7.1p for each of all the other miles travelled.

Work out how much money Millie can claim back from her college.

£ _____

(Total for Question 3 is 4 marks)

4* Daniel went on holiday to Italy but forgot to take his camera.

A camera in Italy cost €75.60.

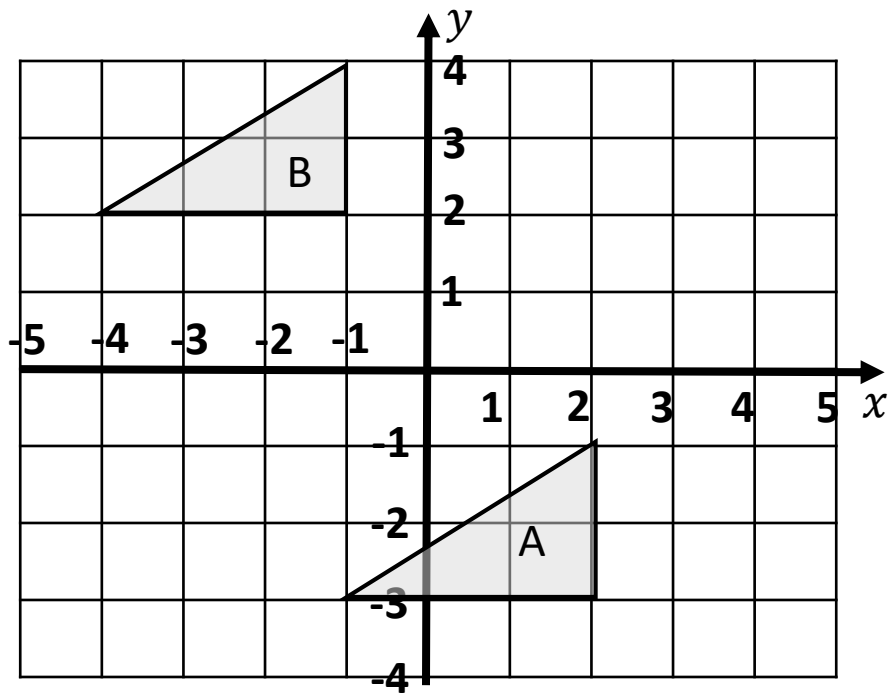
The same camera in England cost £43.75.

The exchange rate was £1=€1.68.

In which country was the camera cheapest?

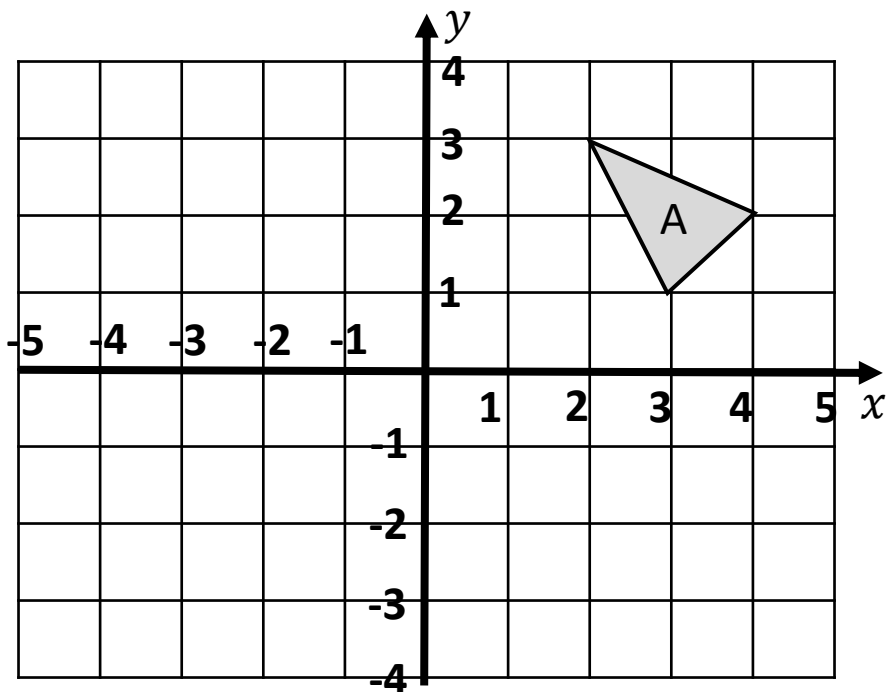
(Total for Question 4 is 3 marks)

5



(a) Describe fully the single transformation from A to B.

(2)



(b) Enlarge Shape A by a scale factor of $-\frac{1}{2}$ through the centre O.

(3)

(Total for Question 5 is 5 marks)

- 6 A 45g chocolate bar contains 12g of fat.
A 120g chocolate bar contains 34g of fat.
Which chocolate bar contains a higher proportion of fat?

(Total for Question 6 is 3 marks)

- 7 Here are the first five terms of an arithmetic sequence.

5 8 11 14 ...

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

_____ (1)

In another arithmetic sequence the n th term is $5n - 9$

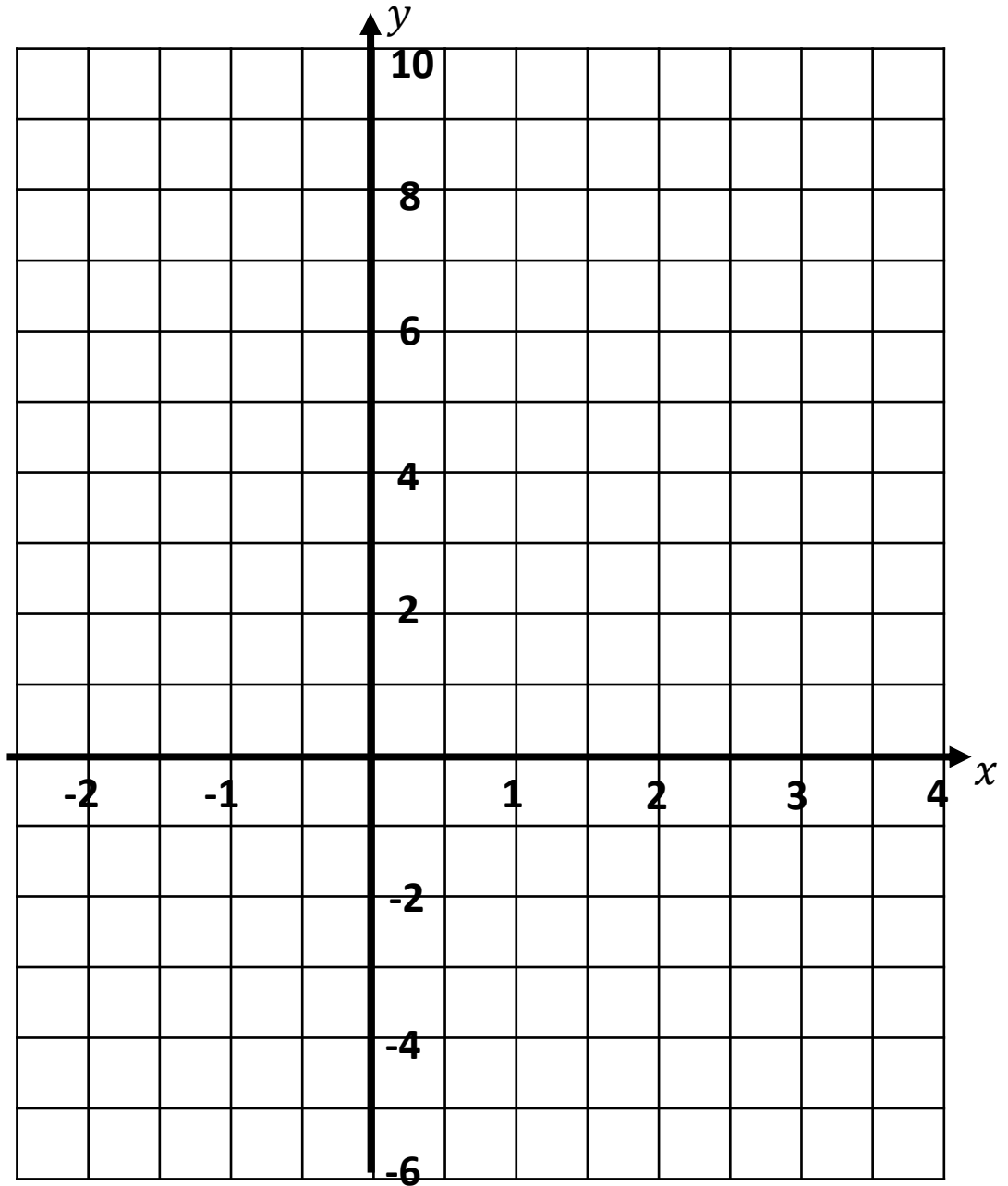
Tom says that there is a number that is in both sequences.

- (b) Is Tom correct? (Explain your answer fully).

_____ (2)

(Total for Question 7 is 3 marks)

8 On the grid draw the graph of $y = 4 - 2x$ from $x = -2$ to $x = 4$



(Total for Question 8 is 3 marks)

9*

A flag pole is vertical to the ground and is 14 metres tall.

Guide ropes are attached every 90 degrees around to the flag pole to support it.

Each rope must be secured into the ground with a peg that is at least 4.5 metres away from the flag pole.

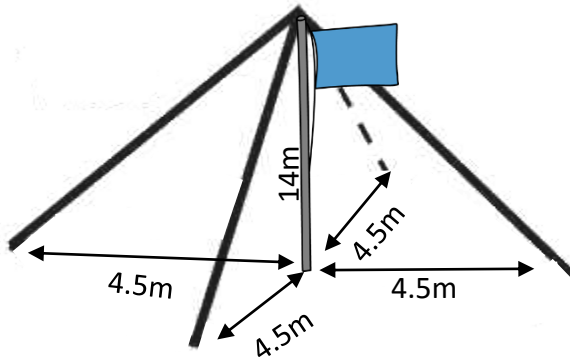


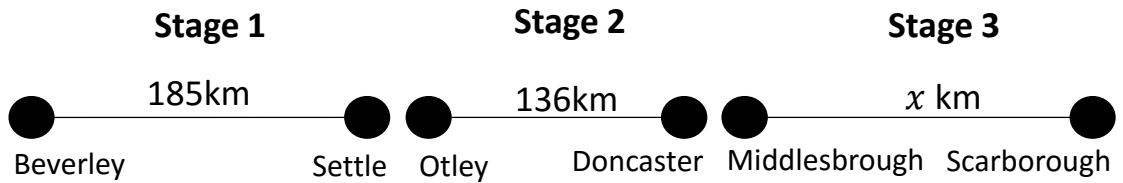
Diagram **NOT** accurately drawn

Ellie has 60 metres of rope. Does Ellie have enough rope to secure the flag pole?

(Total for Question 9 is 4 marks)

10* There were three stages in the Tour De Yorkshire 2016.

Diagram **NOT**
accurately drawn



The winner of the women's race completed the stages as follows;

Stage 1 in 5 hours,

Stage 2 at an average speed of 40km/h,

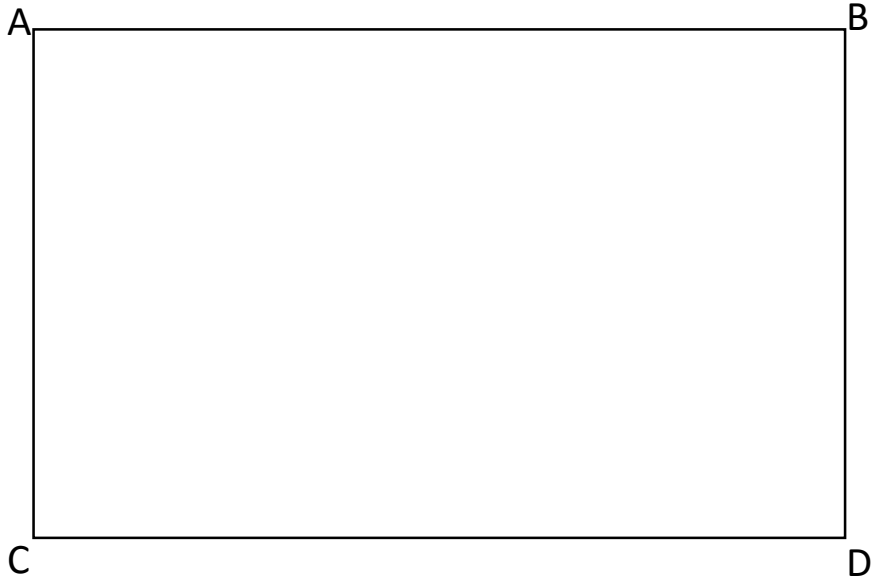
Stage 3 in 5 hours at an average speed of 39.6 km/h.

What was the average speed of the winner over the course of the 3 days?

(Total for Question 10 is 3 marks)

11 Find the shaded region of points within the rectangle ABCD that satisfy both of the following conditions.

- The points are nearer to the line AB than DC
- The points are less than 5cm away from the point B.



(Total for Question 11 is 3 marks)

- 12*** The perimeter of the shape is 70 metres.

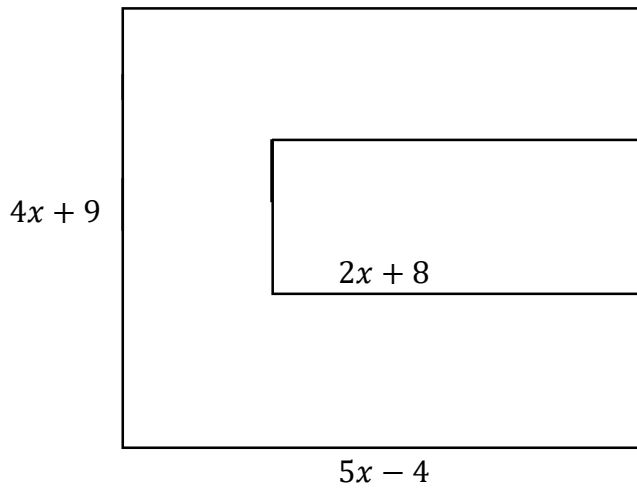


Diagram **NOT**
accurately drawn

Calculate the value of x .

(Total for Question 12 is 4 marks)

- 13** Ahmed, Brogan and Charlie share money in the ratio 2:5:7.
Brogan and Charlie in total have £24 more than Ahmed.
How much money does Ahmed have?

£ _____

(Total for Question 13 is 3 marks)

14* Hamza wants to invest £5000 for 3 years in the same bank.

Miss B's Local Bank

Compound Interest

4% for the first year

1.5% for each extra year

Shark International Bank

Compound Interest

5% for the first year

1% for each extra year

At the end of 3 years Hamza wants to have as much money as possible.

Which bank should he invest his money in?

(Total for Question 14 is 4 marks)

- 15** The equation $x^3 - 2x = 161$
has solutions between 5 and 6.
Use trial and improvement method to find this solution.
Give your answer correct to one decimal place.

(Total for Question 15 is 4 marks)

- 16** A basket ball team scored a mean of 3 goals in 5 games.
They played within a cup final and now have a mean of 4 goals in 6 games.
How many goals did they score in the cup final?

(Total for Question 16 is 3 marks)

17

A, B and C are all ship ports.

A ship makes a journey in two stages.

The first leg of the journey starts at port O and ends at port A.

Port A is on a bearing of 030° and 240 m from port O.

The second leg of the journey starts at port A and ends at port B.

Port B is on a bearing of 120° and 200 m from port A.

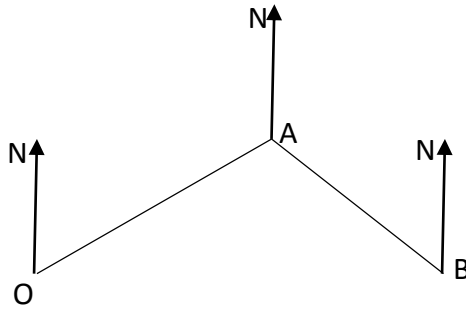


Diagram **NOT**
accurately drawn

(a) Calculate the distance to B from O.

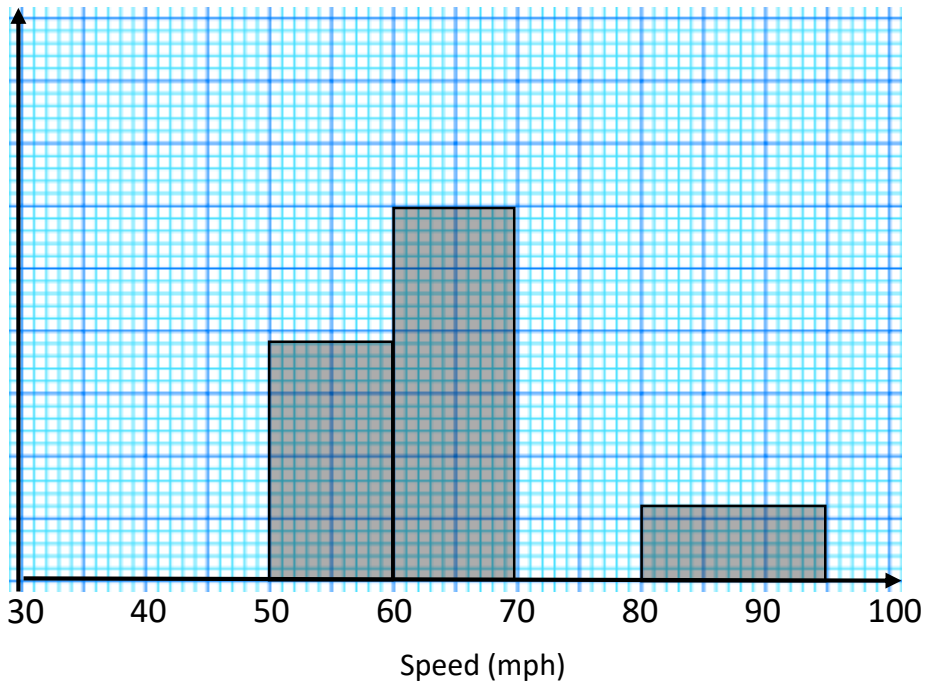
_____ m
(2)

(b) Calculate the bearing to B from O.

_____ (2)

(Total for Question 17 is 4 marks)

- 18 The incomplete table and histogram give some information about the speed of cars on a motorway.



- (a) Use the information in the histogram to complete the frequency table below

Speed (s) mph	Frequency
$30 < s \leq 50$	24
$50 < s \leq 60$	
$60 < s \leq 70$	60
$70 < s \leq 80$	36
$80 < s \leq 95$	

(2)

- (b) Complete the histogram

(2)

- (c) Use the information in the histogram to calculate an estimate for the median speed.

_____ mph

(3)

(Total for Question 18 is 7 marks)

19 Make x the subject of the formula

$$y = \sqrt{\frac{px^2}{q}}$$

$x =$ _____

(Total for Question 19 is 4 marks)

20 138 400 people live in Middlesbrough.
A company carried out a random survey.
It used a random stratified sample of 2500 of the 138 400 people.
1560 of this sample of 2500 people were female.

Work out an estimate for the number of males living in Middlesbrough.

(Total for Question 20 is 3 marks)

- 21** The Length of a rectangle is 86 cm correct to the nearest cm .
The width of a rectangle is 1.2 m correct to 1 decimal place.

Calculate the Upper bound for the area of the rectangle.

_____ cm^2

(Total for Question 21 is 3 marks)

- 22** A straight line, L, passes through the point with coordinates $(6, -2)$ and is perpendicular to the line with the equation $y = 3x - 5$.

Find the equation of the straight line L.

(Total for Question 22 is 3 marks)

- 23** Solve $3x^2 - 6x - 3 = 0$
Give your solutions correct to 2 decimal Places.

(Total for Question 23 is 2 marks)

- 24** Prove, using algebra, that the sum of two consecutive whole numbers is always an odd number.

(Total for Question 24 is 3 marks)

25

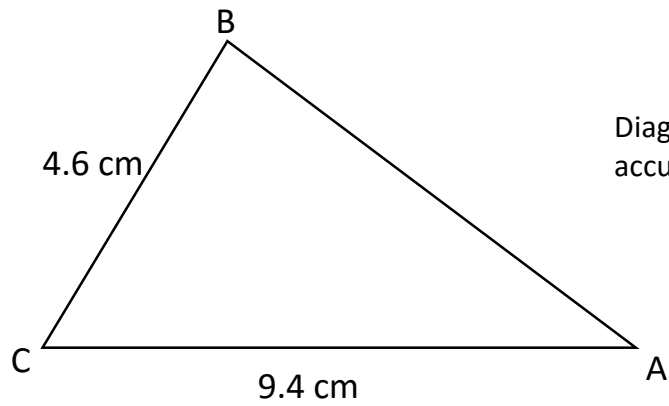


Diagram **NOT**
accurately drawn

$$AB = 4.6 \text{ cm}$$

$$BC = 9.4 \text{ cm}$$

The area of triangle ABC is 15cm^2 .

Calculate the perimeter of the triangle ABC .

Give your answer correct to three significant figures.

_____ cm

(Total for Question 25 is 4 marks)

26 Express the recurring decimal $0.5\dot{7}\dot{3}$ as a fraction.

(Total for Question 26 is 3 marks)

27 For all values of x , $x^2 - 8x + 9 = (x + p)^2 + q$
Find the value of p and the value of q .

$p =$ _____ $q =$ _____

(Total for Question 27 is 2 marks)

28

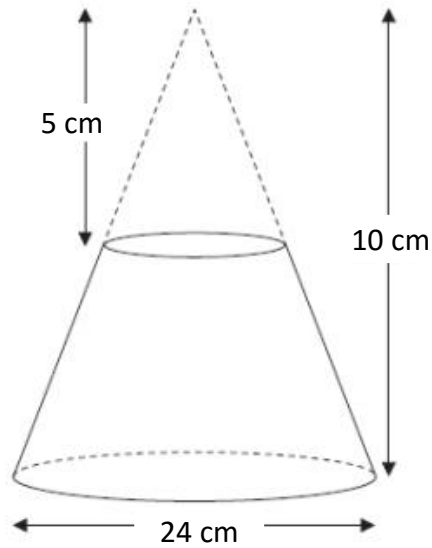


Diagram **NOT**
accurately drawn

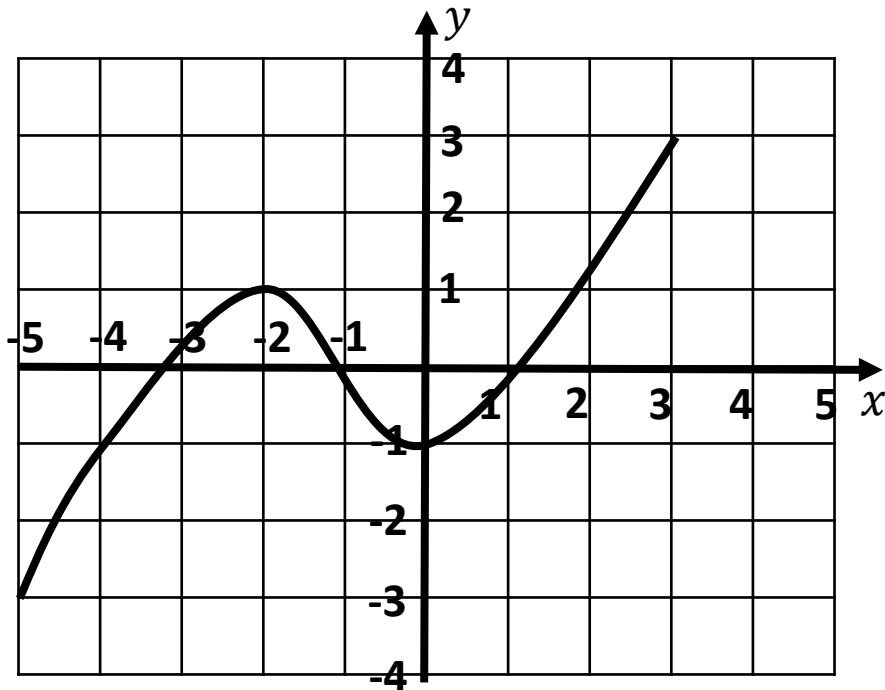
A frustum is made by removing a small cone from a similar large cone.
The height of the small cone is 5 cm.
The height of the large cone is 10 cm.
The diameter of the base of the large cone is 24 cm.
Work out the volume of the frustum.
Give your answer correct to 3 significant figures.

_____ cm^3

(Total for Question 28 is 4 marks)

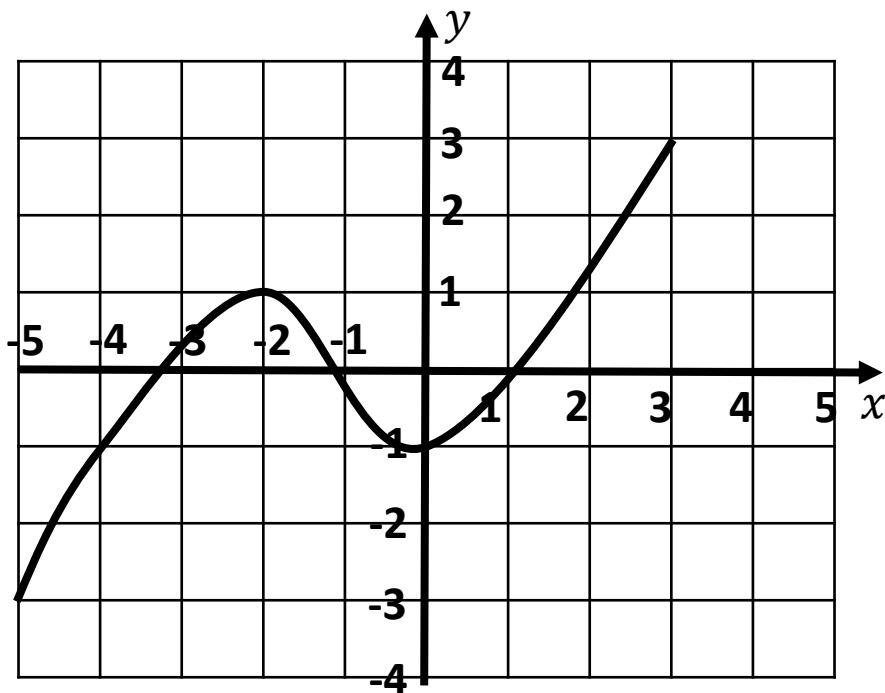
The graph of $y = f(x)$ is shown on the grids.

- (a) On this grid, sketch the graph of $y = f(x - 2)$



(2)

- (b) On this grid, sketch the graph of $y = -f(x)$



(2)

(Total for Question 29 is 4 marks)

TOTAL FOR PAPER 100 MARKS