

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 2

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

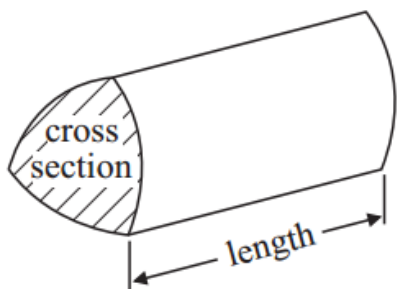
Q	Topic	Your Mark	Total
1	Recipe		4
2	Scatter Graph		3
3	Form and Solve an Equation		4
4	Probability		2
5	Circumference of a Circle		4
6	Transformation – Translation		3
7	Percentage Change		3
8	Best Buy – Shop Offer per Item		3
9	Perimeter – Area of Trapezium & Pythagoras		4
10	Frequency Polygon		6
11	Trial and Improvement		6
12	Straight Line Graph		3
13	Equation of a Perpendicular Line		3
14	Reverse Percentage		2
15	Averages from a Grouped Frequency Table		7
16	Density		2
17	Bearings – Trigonometry		5
18	Bounds		3
19	Similar Shapes		4
20	Histogram		7
21	Equation of a Circle		2
22	Change the Subject		4
23	Algebraic Fraction – Simplify		3
24	Stratified Sample		2
25	Arc Length, Area of Sector & Area of Triangle		7
26	Trigonometry Transformation Graphs		4
	Total		100

GCSE Mathematics

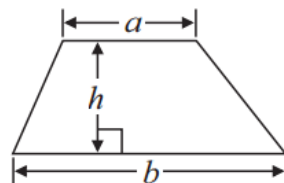
Formulae: Higher Tier

**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 = $\frac{1}{2}(a + b)h$

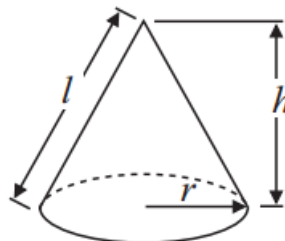
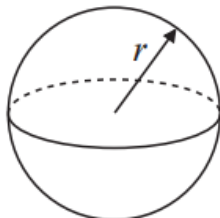


Volume of sphere = $\frac{4}{3}\pi r^3$

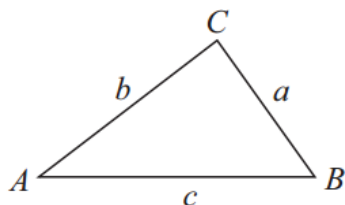
Volume of Cone = $\frac{1}{3}\pi r^2 h$

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

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 Here are the ingredients needed to make 12 Cookies.

Cookies

Makes **12** cookies

240g of flour

180g of Butter

60g of Sugar

1 Egg

Anna makes some cookies.

She uses 150g of sugar.

(a) How many cookies does Anna make?

_____ (2)

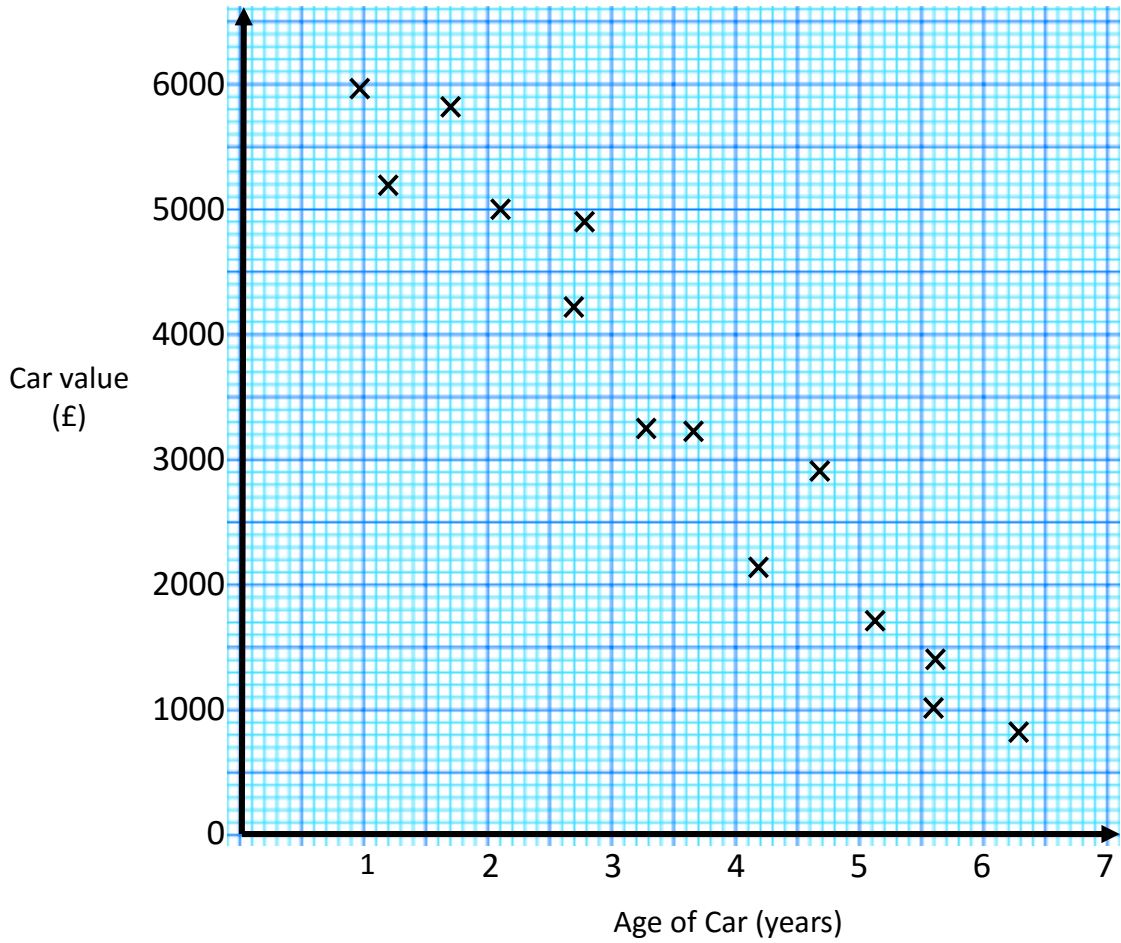
Liam has 840g of flour
 540g of Butter
 165g of Sugar
 8 Eggs

(b) Work out the greatest number of Cookies Liam can make.

_____ (2)

(Total for Question 1 is 4 marks)

2 The scatter graph shows information about 14 cars ages and values.



(a) Describe the relationship between the age of a car and it's value.

(1)

Rebekah buys a car just out of warrantee at 3.5 years old from a dealership.

(b) Estimate the price of the car Rebekah bought.

£ _____
(2)

(Total for Question 2 is 3 marks)

3 Lina, Jasmine and Niza are friends.

They each get pocket money from their parents.

Jasmine gets half as much pocket money as Lina..

Niza gets £4 less than Lina.

(a) Write an expression for how much pocket money Niza gets.

_____ (1)

The sum of their pocket money is £22.40.

(b) Calculate how much money they each get.

Lina £ _____ Jasmine £ _____ Niza £ _____ (3)

(Total for Question 3 is 4 marks)

4 There are several balls in a bag.

The probabilities of selecting each type is shown in the table.

Colour	Green	Yellow	Blue	Pink
Probability	0.27	x	0.39	x

Calculate the probability of selecting a pink ball.

_____ (Total for Question 4 is 2 marks)

5 Calculate the perimeter of the shaded shape.

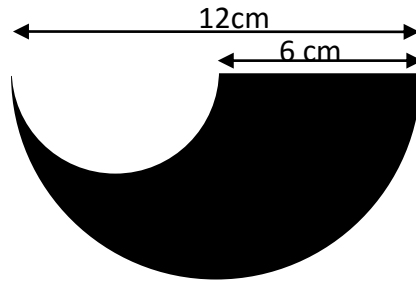


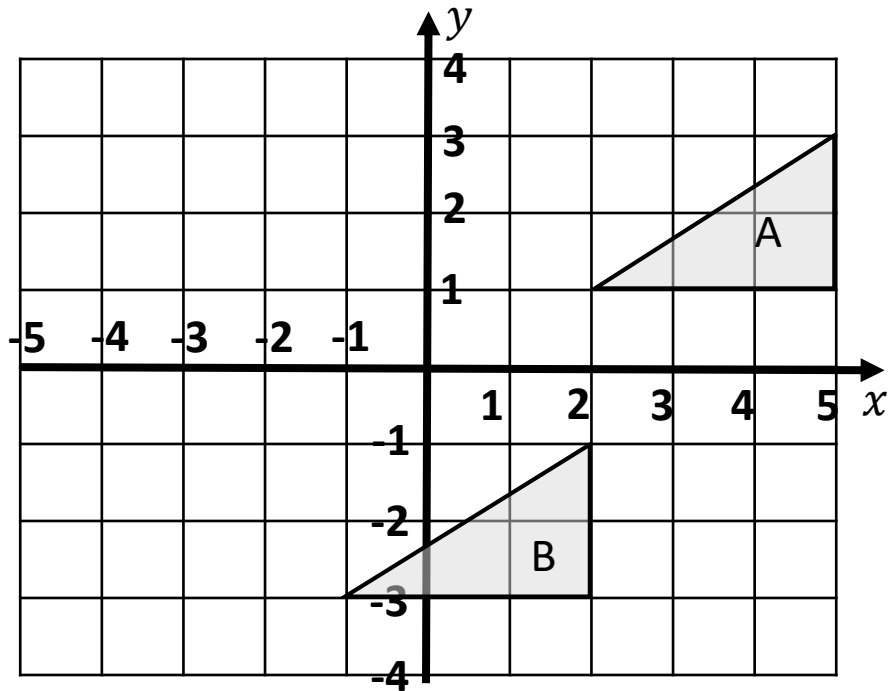
Diagram **NOT** accurately drawn

Give your answer to 3 significant figures.

_____ cm

(Total for Question 5 is 4 marks)

6



Describe fully the single transformation from A to B.

(Total for Question 6 is 3 marks)

7

A car depreciates in value as shown in the table below.

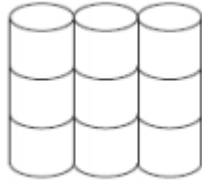
Vehicle Age	Value
2012 - New	£15500
2013 - After 1 year	£11000
2014 – After 2 years	£8500
2015 – After 3 years	£5900

During which year is the percentage decrease in the value of the car the greatest?

(Total for Question 7 is 3 marks)

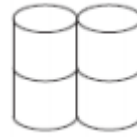
8*

Cushelle



9 Rolls for £3.50

Andrex



2 packs of 4 Rolls for £3.25

A pack of 9 rolls for £3.50.

Two packs of 4 rolls for £3.25

Which offer gives you better value for money?

You must show all your working out.

(Total for Question 8 is 3 marks)

9* ABCD is an isosceles trapezium.

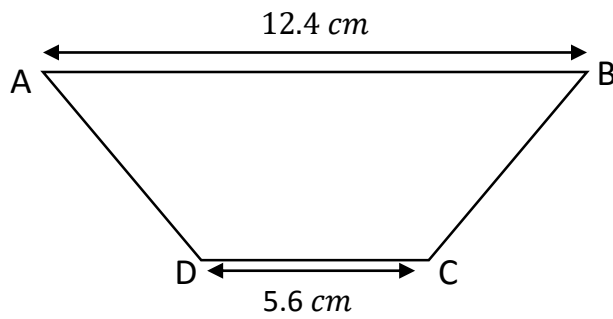


Diagram **NOT** accurately drawn

The area of the trapezium is 50.4cm^2 .

Calculate the perimeter of the trapezium.

Give your answer to 3 significant figures.

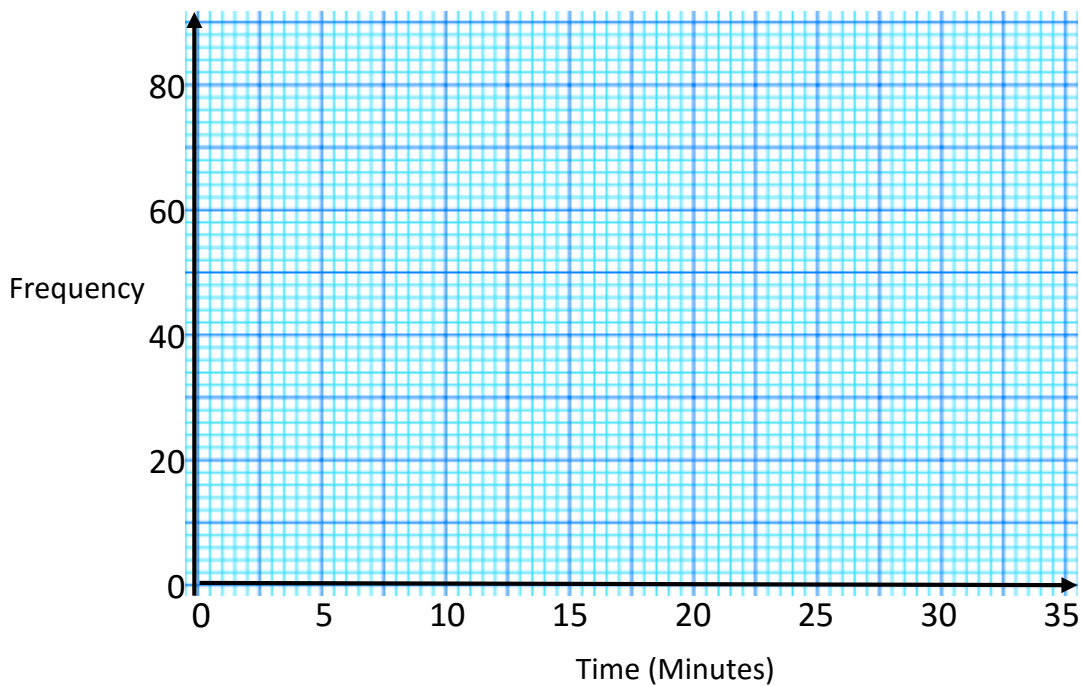
_____ cm

(Total for Question 9 is 4 marks)

- 10 The frequency table gives information about the times it took year 11 students to get to school one day.

Weight (w) kg	Frequency
$0 < t \leq 5$	55
$5 < w \leq 10$	66
$10 < w \leq 15$	47
$15 < w \leq 25$	23
$25 < w \leq 35$	9

- (a) Draw a frequency polygon for this information.



- (b) Write down the modal class interval

_____ (1)

One student is chosen at random.

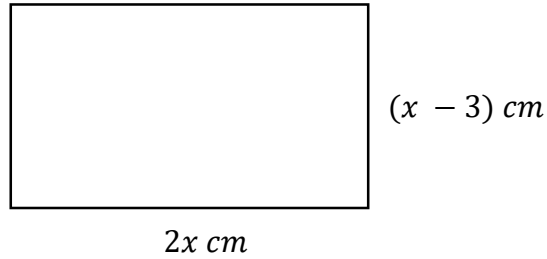
- (c) Calculate the probability that the student took more than 15 minutes to get to school.

_____ (2)

(Total for Question 10 is 6 marks)

11

Diagram **NOT**
accurately drawn



The rectangle has a length of $2x \text{ cm}$.

The rectangle has a height of $(x - 3) \text{ cm}$.

The area of the rectangle is 89 cm^2 .

(a) Show that $2x^2 - 6x = 89$

(2]

The equation $2x^2 - 6x = 89$ has a solution between 8 and 9.

(b) Use a trial and improvement method to find this solution.

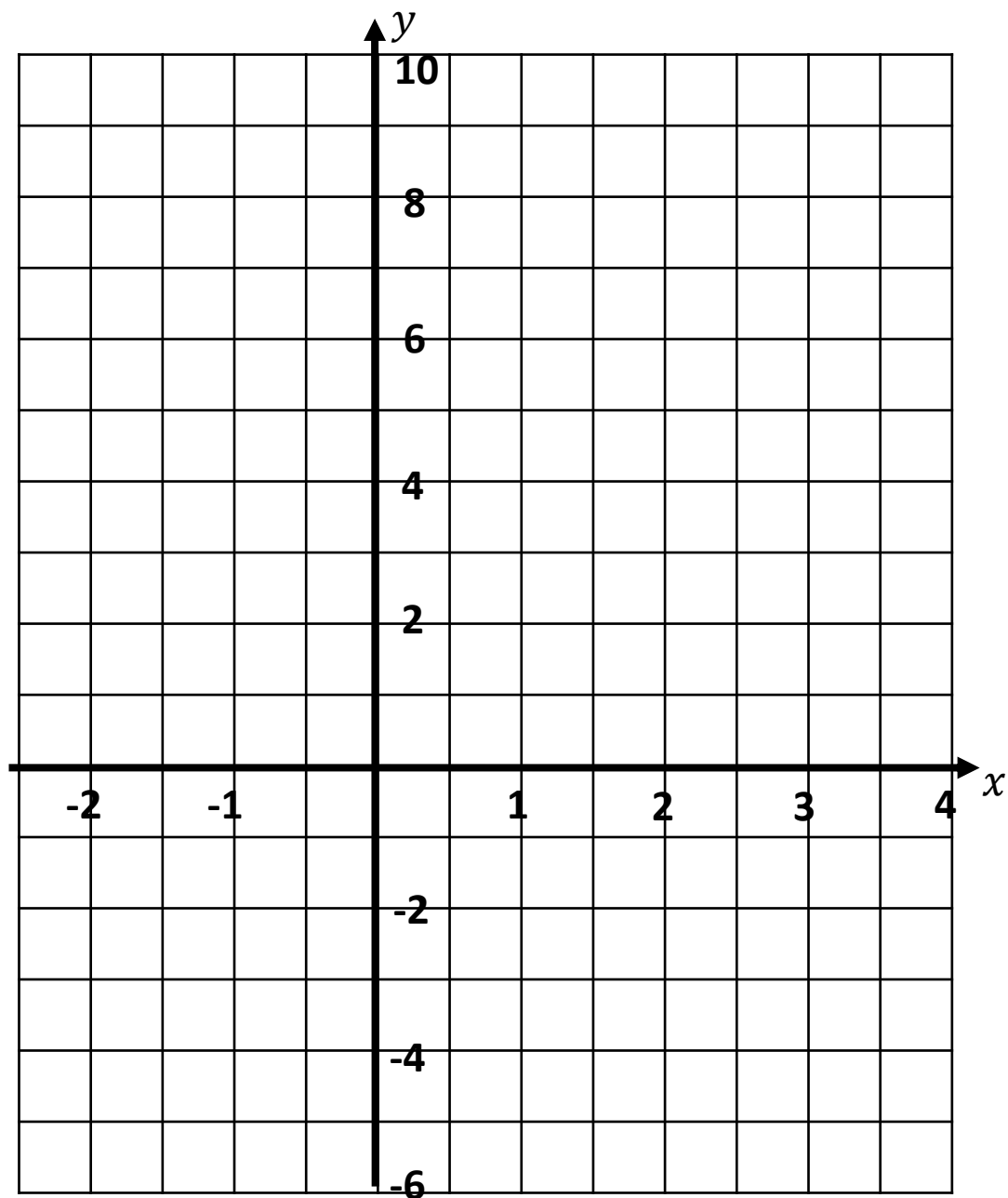
Give your answer correct to one decimal place.

You must show **ALL** your working.

$x = \underline{\hspace{2cm}} \text{ cm}$
(4]

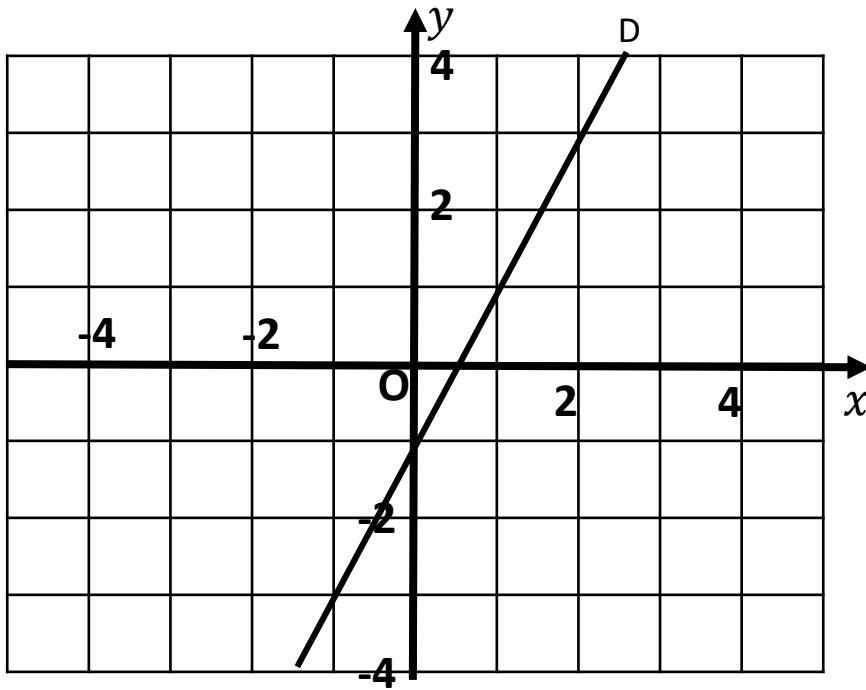
(Total for Question 11 is 6 marks)

12 On the grid draw the graph of $y = 4 - 3x$ from $x = -2$ to $x = 3$



(Total for Question 12 is 3 marks)

- 13 The line D is drawn below.



Find an equation of the line perpendicular to line D that passes through the point $(2, -5)$.

(Total for Question 13 is 3 marks)

- 14 The price of a Middlesbrough season ticket has increased since the 2015/16 season by 23.9% to £569.94 for the 2016/17 season.
- Calculate the price of a season ticket in the 2015/16 season.

£ _____

(Total for Question 14 is 2 marks)

- 14 The grouped frequency table give information about the height of 150 students.

Height (h) cm	Frequency
$90 < h \leq 120$	34
$120 < h \leq 140$	48
$140 < h \leq 160$	44
$160 < h \leq 170$	16
$170 < h \leq 180$	8

- (a) Work out the percentage of people who are taller than 160 cm.

_____ (2)

- (b) Calculate the median class interval.

_____ (1)

- (c) Calculate an estimate for the mean.

_____ cm (4)

(Total for Question 14 is 7 marks)

- 15 A silver pendant has a volume of 8 cm^3 .
The density of the silver is 10.5 grams per cm^3 .
Work out the mass of the silver pendant.

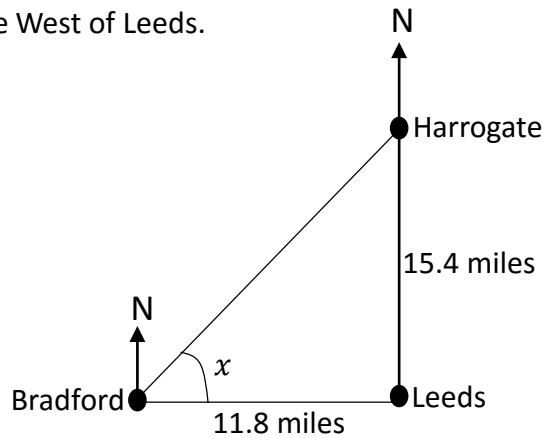
_____ grams

(Total for Question 15 is 2 marks)

16 Harrogate is 15.4 miles due North of Leeds.

Bradford is 11.8 miles due West of Leeds.

Diagram **NOT**
accurately drawn



(a) Calculate the size of the angle marked x .

Give your answer correct to 3 significant figures.

$$x = \frac{\quad}{\quad} \quad \circ$$

(3]

(b) Find the bearing of Bradford from Harrogate.

Give your answer correct to 3 significant figures.

$$\frac{\quad}{\quad} \quad \circ$$

(2]

(Total for Question 16 is 5 marks)

17 The average fuel consumption (c) of Jessica's car, in miles per gallon is given by the formula

$$c = \frac{d}{f}$$

Where d is the distance travelled, in miles, and f is the fuel used, in gallons.

$d = 187$ miles correct to 3 significant figures.

$f = 6.23$ gallons correct to 3 significant figures.

Calculate the upper bound of c .

Give your answer to 3 significant figures.

_____ mpg

(Total for Question 17 is 3 marks)

18 The diagram shows two similar solids A and B.

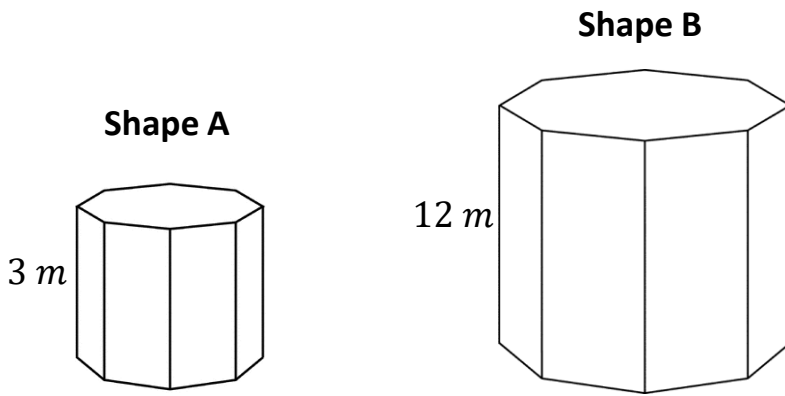


Diagram **NOT** accurately drawn

Solid A has a total surface area of $50m^2$

(a) Work out the total surface area of solid B.

_____ m^2
(2)

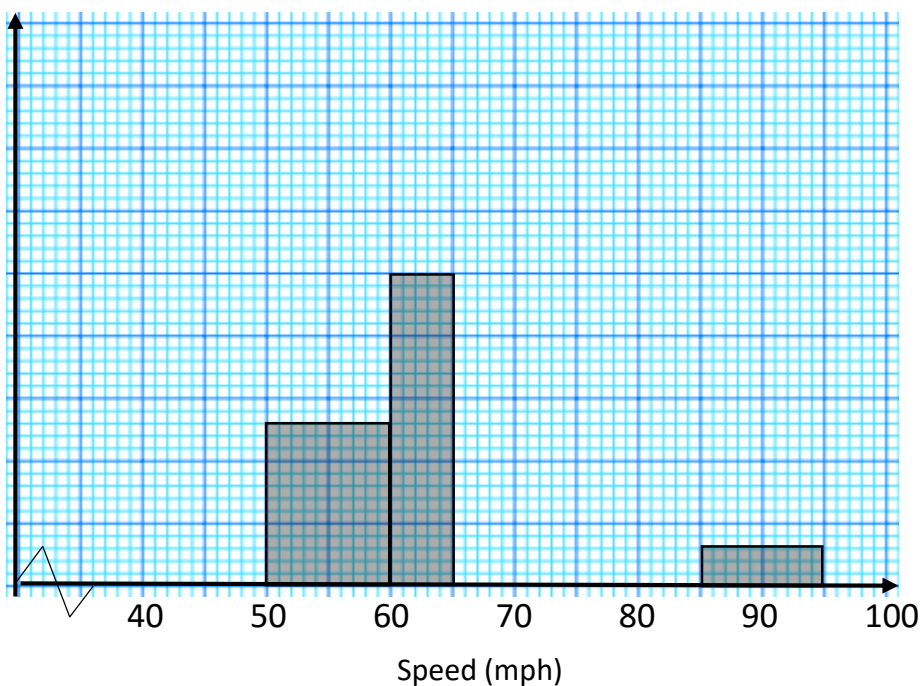
Solid B has a volume of $240m^3$

(b) Work out the Volume of solid A

_____ m^3
(2)

(Total for Question 18 is 4 marks)

- 19 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
$40 < s \leq 50$	8
$50 < s \leq 60$	
$60 < s \leq 65$	25
$65 < s \leq 85$	76
$85 < s \leq 95$	

(2)

- (b) Complete the histogram

(2)

- (c) The speed limit is 70 mph on the motorway.

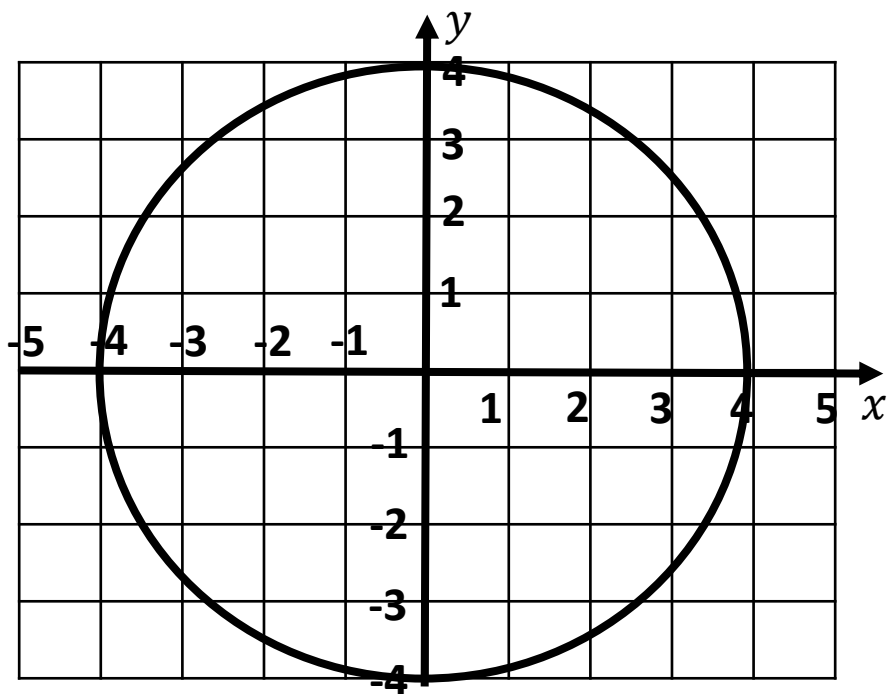
Use the histogram to calculate how many people were speeding.

(3)

(Total for Question 19 is 7 marks)

20

Work out the equation of the circle shown in the image.



(Total for Question 20 is 2 marks)

21

Make p the subject of the formula.

$$m = \frac{n^2 + p}{p - n}$$

$p =$ _____

(Total for Question 21 is 4 marks)

22

Simplify

$$\frac{4x^2+8x}{x^2-3x-10}$$

(Total for Question 22 is 3 marks)

23

The table shows the number of boys and the number of girls in each year group competing in the Times Table Championships.

There are 150 boys and 150 girls taking part.

Year Group	Number of Boys	Number of Girls
6	53	82
7	97	68
Total	150	150

Mr Ready took a stratified sample of 25 girls, by year group.

Work out the number of year 6 girls in his sample.

(Total for Question 23 is 2 marks)

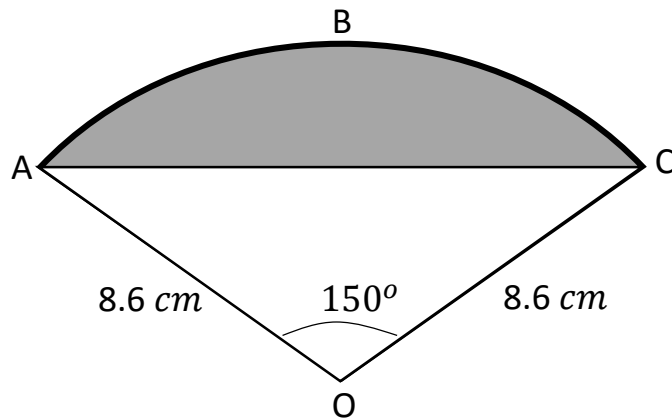


Diagram **NOT**
accurately drawn

The diagram shows a sector OABC of a circle, centre O.
The radius of the circle is 8.6 cm.
Angle $AOC = 150^\circ$.

- (a) Calculate the length of the arc ABC of the sector.
Give your answer correct to 3 significant figures

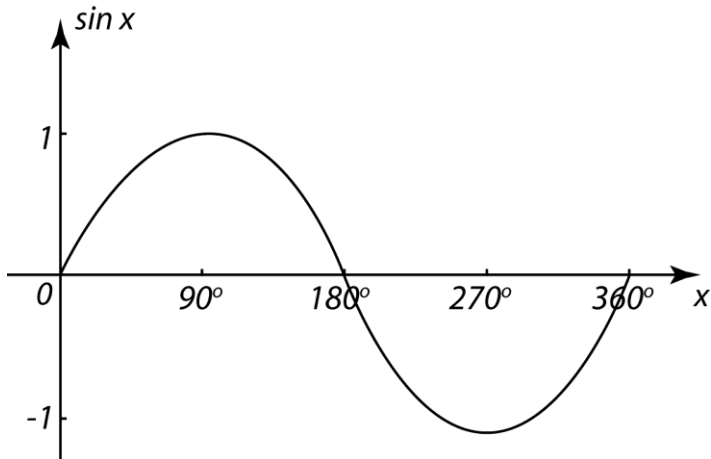
_____ cm
(3)

- (b) Calculate the area of the shaded section.
Give your answer correct to 3 significant figures

_____ cm^2
(4)

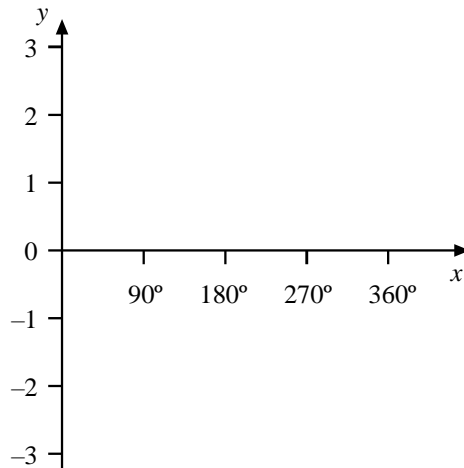
(Total for Question 24 is 7 marks)

A sketch of the curve of $y = \sin x^\circ$ for $0^\circ \leq x \leq 360^\circ$ is shown below.



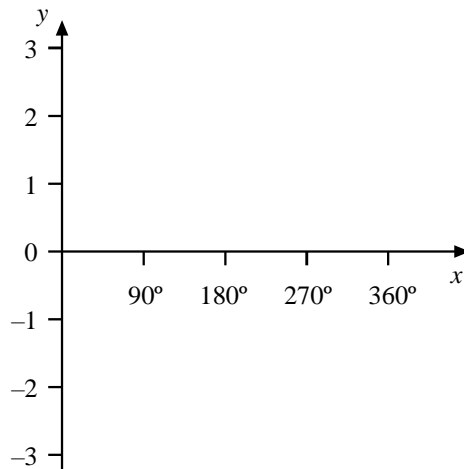
On the axes below sketch the graph of

(a) $y = 2 \sin x$ for $0^\circ \leq x \leq 360^\circ$



(2)

(b) $y = -\sin x$ for $0^\circ \leq x \leq 360^\circ$



(2)

(Total for Question 25 is 4 marks)

TOTAL FOR PAPER 100 MARKS