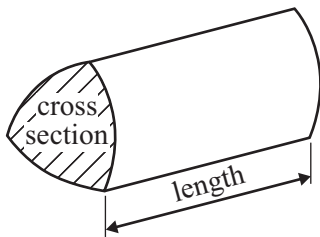


GCSE Mathematics (Linear) 1380

Formulae: Higher Tier

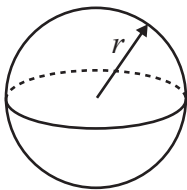
**You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.**

Volume of a prism = area of cross section \times length



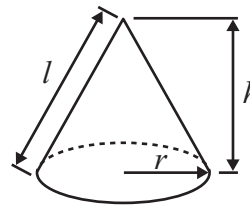
Volume of sphere = $\frac{4}{3} \pi r^3$

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

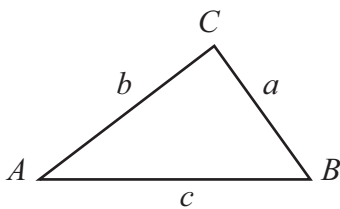


Volume of cone = $\frac{1}{3} \pi r^2 h$

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 NINETEEN questions. Write your answers in the spaces provided. You must write down all stages in your working.

1. Ali asked 200 students which sport they like best. They could choose swimming or tennis or athletics.

The two-way table shows some information about their answers.

	Swimming	Tennis	Athletics	Total
Female			19	
Male	36	42		
Total	79		54	200

Complete the two-way table.

(Total 3 marks)

Q1

2. (a) Use your calculator to work out the value of $\frac{8.7 \times 12.3}{9.5 - 5.73}$
Write down all the digits from your calculator.
Give your answer as a decimal.

.....
(2)

- (b) Write your answer to part (a) correct to 1 significant figure.

.....
(1)

(Total 3 marks)

Q2

3. (a) $p = 2$
 $q = -4$

Work out the value of $3p + 5q$

.....
(2)

(b) Factorise $3m - 6$

.....
(1)

(Total 3 marks)

Q3

4. Frank did a survey on the areas of pictures in a magazine.

The magazine had 60 pages.

Frank worked out the area of each of the pictures in the first 2 pages.

This may not be a good method to do the survey.

Explain why.

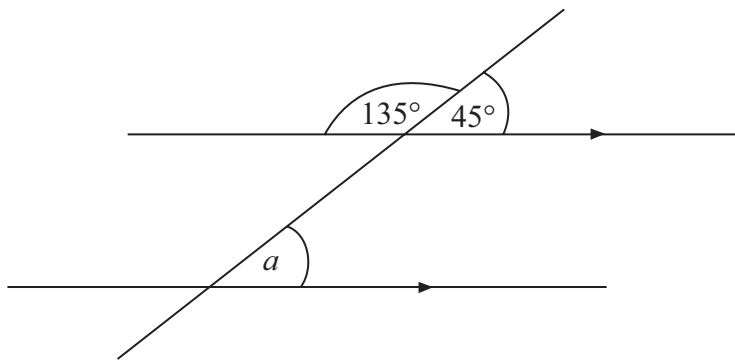
.....
.....

(Total 1 mark)

Q4

5.

Diagram NOT accurately drawn



(i) Write down the size of the angle marked a .

.....

(ii) Give a reason for your answer.

.....

(Total 2 marks)

Q5

6. A circle has a radius of 5 cm.

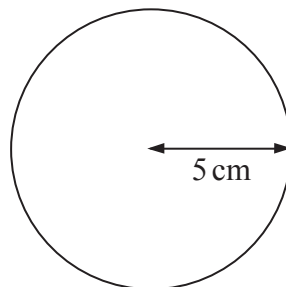


Diagram NOT accurately drawn

Work out the area of the circle.
Give your answer correct to 3 significant figures.

..... cm²

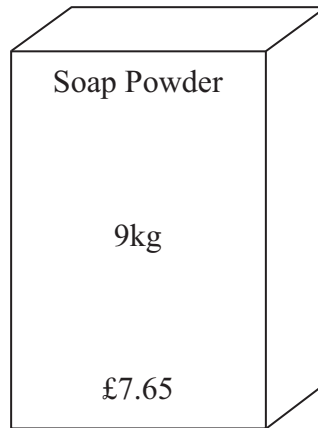
(Total 2 marks)

Q6

7. Soap powder is sold in two sizes of box.



Small box



Large box

A small box contains 2 kg of soap powder and costs £1.72
A large box contains 9 kg of soap powder and costs £7.65

Which size of box gives the better value for money?

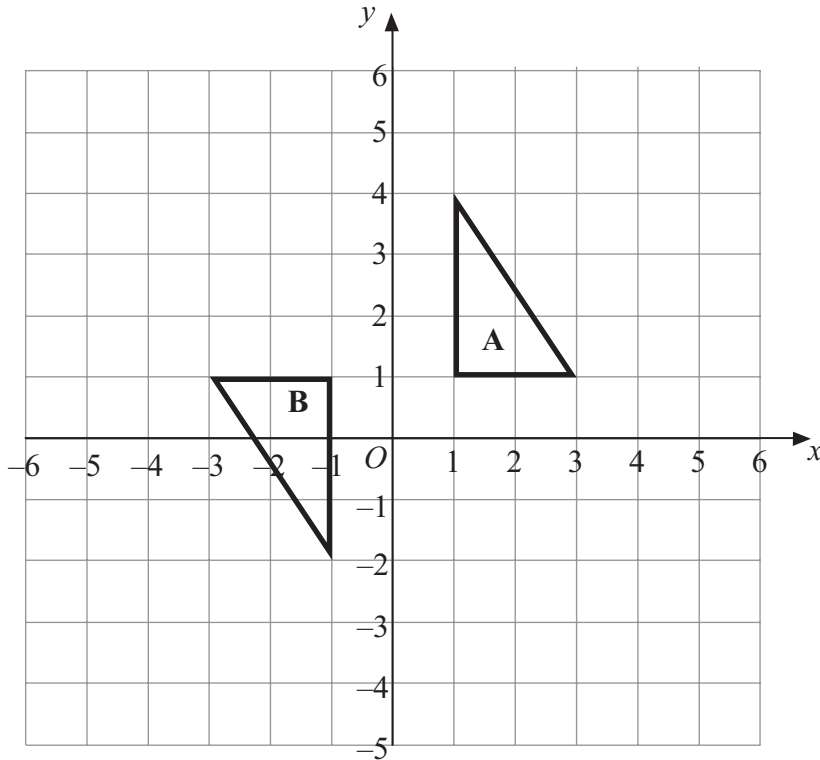
.....

Explain your answer.
You must show all your working.

(Total 3 marks)

Q7

8.



Describe fully the single transformation that maps triangle A onto triangle B.


.....

(Total 3 marks)

Q8

9. A computer costs £360 plus $17\frac{1}{2}\%$ VAT.

Calculate the total cost of the computer.

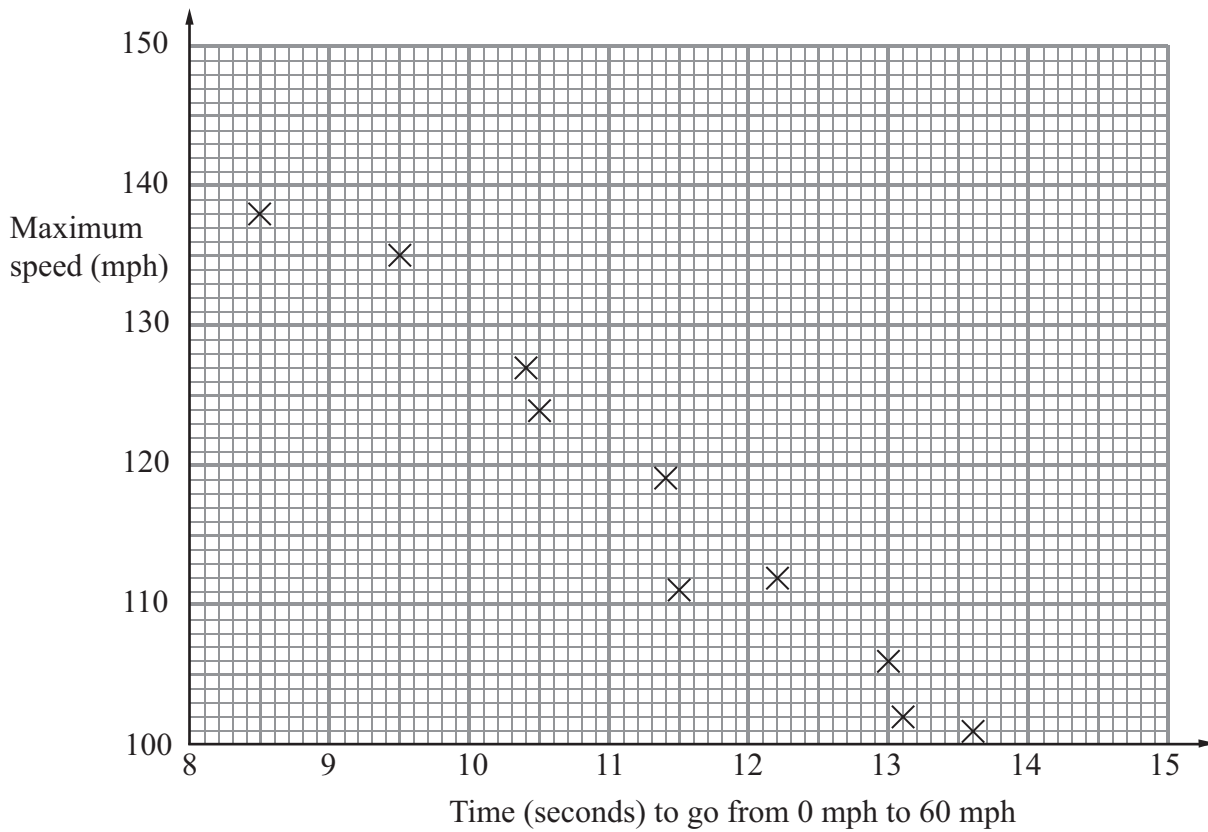
	£360
	plus
	$17\frac{1}{2}\%$ VAT

£

(Total 3 marks)

Q9

10. The scatter graph shows some information about 10 cars. It shows the time, in seconds, it takes each car to go from 0 mph to 60 mph. For each car, it also shows the maximum speed, in mph.



- (a) What type of correlation does this scatter graph show?

.....
(1)

The time a car takes to go from 0 mph to 60 mph is 11 seconds.

- (b) Estimate the maximum speed for this car.

..... mph
(2)

(Total 3 marks)

Q10

11.

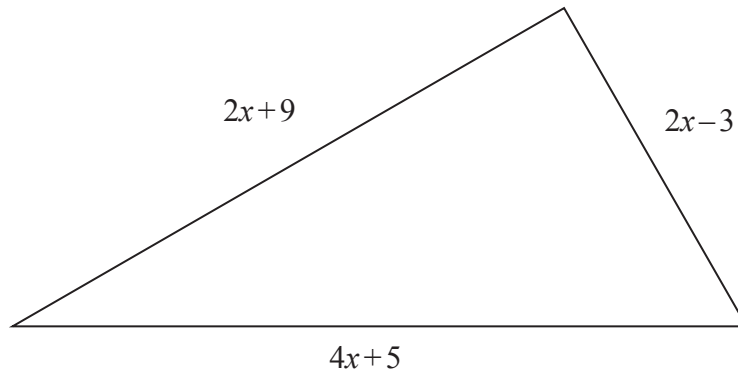


Diagram **NOT** accurately drawn

In the diagram, all measurements are in centimetres.

The lengths of the sides of the triangle are

- $2x+9$
- $2x-3$
- $4x+5$

- (a) Find an expression, in terms of x , for the perimeter of the triangle.
Give your expression in its simplest form.

.....
(2)

The perimeter of the triangle is 39 cm.

- (b) Find the value of x .

$x =$
(2)

(Total 4 marks)

Q11

Leave
blank

12. A piece of wood is 180 cm long.
Tom cuts it into three pieces in the ratio 2 : 3 : 4

Work out the length of the longest piece.

..... cm

(Total 3 marks)

Q12

13. The equation

$$x^3 + 2x = 60$$

has a solution between 3 and 4

Use a trial and improvement method to find this solution.
Give your answer correct to 1 decimal place.
You must show all your working.

$x =$

(Total 4 marks)

Q13

14. (a) Simplify $m^3 \times m^4$

.....
(1)

(b) Simplify $p^7 \div p^3$

.....
(1)

(c) Simplify $4x^2y^3 \times 3xy^2$

.....
(2)

(Total 4 marks)

Q14

15.

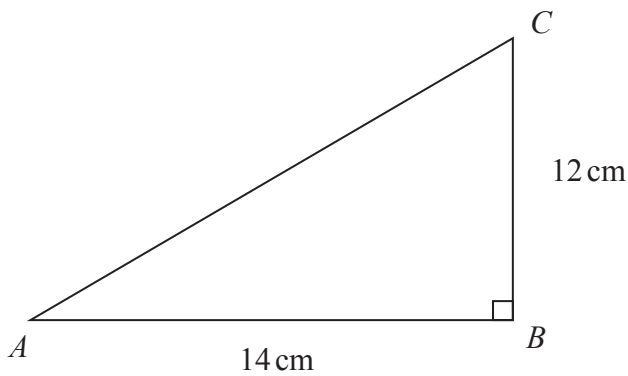


Diagram NOT accurately drawn

ABC is a right-angled triangle.

$AB = 14$ cm.

$BC = 12$ cm.

Calculate the length of AC .

Give your answer correct to 3 significant figures.

..... cm

(Total 3 marks)

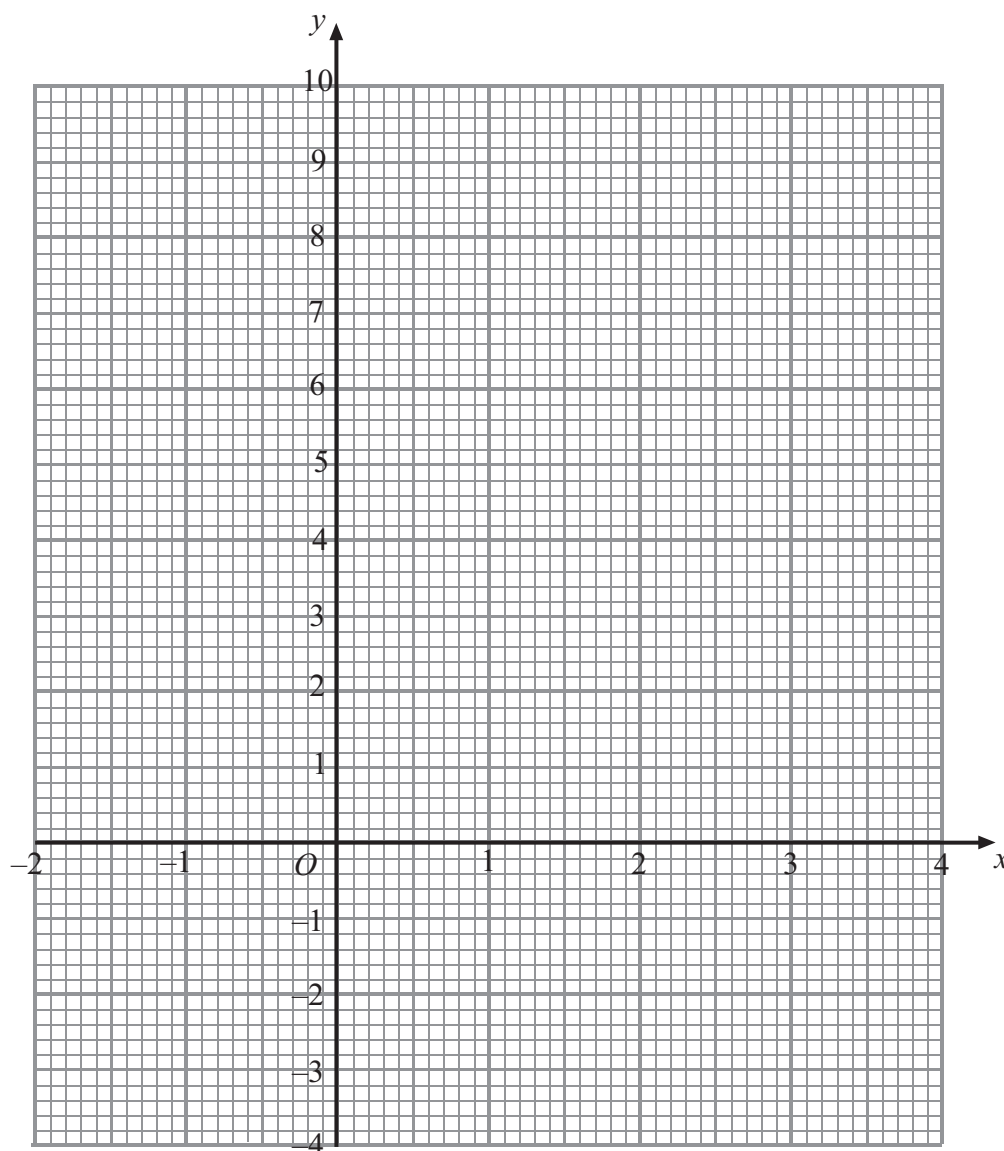
Q15

16. (a) Complete the table of values for $y = x^2 - 3x - 1$

x	-2	-1	0	1	2	3	4
y		3	-1	-3		-1	

(2)

(b) On the grid, draw the graph of $y = x^2 - 3x - 1$ for values of x from -2 to 4



(2)

Q16

(Total 4 marks)

17. The table shows some information about the heights (h cm) of 100 students.

Height (h cm)	Frequency		
$120 \leq h < 130$	8		
$130 \leq h < 140$	16		
$140 \leq h < 150$	25		
$150 \leq h < 160$	30		
$160 \leq h < 170$	21		

(a) Find the class interval in which the median lies.

.....
(1)

(b) Work out an estimate for the mean height of the students.

..... cm
(4)

(Total 5 marks)

Q17

18. (a) Expand and simplify $(x - 3)(x + 5)$

.....
(2)

(b) Solve $\frac{29 - x}{4} = x + 5$

$x =$
(3)

(Total 5 marks)

Q18

19.

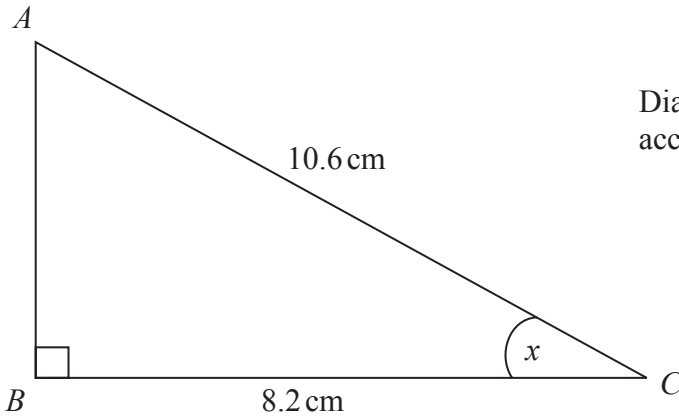


Diagram **NOT** accurately drawn

ABC is a right-angled triangle.
 $AC = 10.6$ cm.
 $BC = 8.2$ cm.

Calculate the size of the angle marked x .
 Give your answer correct to 3 significant figures.

.....^o

(Total 3 marks)

Q19