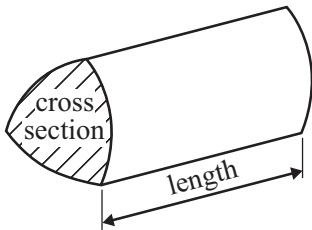


GCSE Mathematics (Linear) 1380

Formulae: Higher Tier

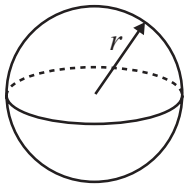
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



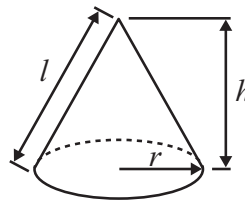
Volume of sphere = $\frac{4}{3}\pi r^3$

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

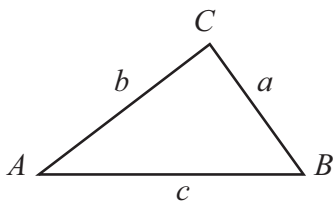


Volume of cone = $\frac{1}{3}\pi r^2 h$

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 = $\frac{1}{2}ab \sin C$



1. Gary wants to find out how much time teenagers spend listening to music.
He uses this question on a questionnaire.

How many hours do you spend listening to music?			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1 to 5	5 to 10	10 to 20	over 20

- (a) Write down **two** things wrong with this question.

1

.....

2

.....

(2)

- (b) Design a better question for Gary's questionnaire to find out how much time teenagers spend listening to music.

(2)

Q3

(Total 4 marks)



2. (a) Find the highest common factor (HCF) of 24 and 30

.....
(1)

(b) Find the lowest common multiple (LCM) of 4, 5 and 6

.....
(2)

(Total 3 marks)

Q4

3. Melissa is 13 years old.
Becky is 12 years old.
Daniel is 10 years old.

Melissa, Becky and Daniel share £28 in the ratio of their ages.
Becky gives a third of her share to her mother.

How much should Becky now have?

£

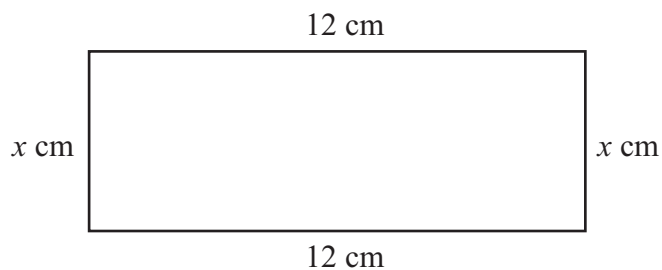
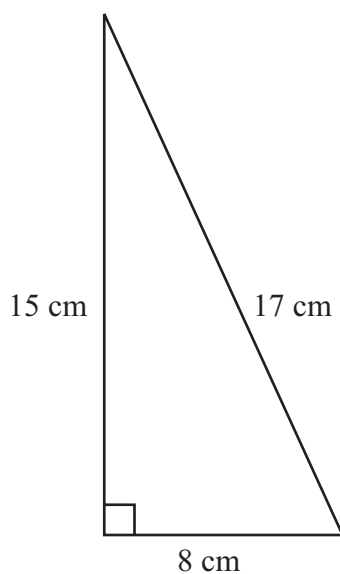
(Total 4 marks)

Q5



4. The diagrams show a right-angled triangle and a rectangle.

Diagrams **NOT** accurately drawn



The area of the right-angled triangle is equal to the area of the rectangle.

Find the value of x .

$x = \dots\dots\dots$

(Total 4 marks)

Q7



5.

The temperature ($T^{\circ}\text{C}$) at noon at a seaside resort was recorded for a period of 60 days. The table shows some of this information.

Temperature ($T^{\circ}\text{C}$)	Number of days
$10 < T \leq 14$	2
$14 < T \leq 18$	8
$18 < T \leq 22$	14
$22 < T \leq 26$	23
$26 < T \leq 30$	9
$30 < T \leq 34$	4

Calculate an estimate for the mean temperature at noon during these 60 days. Give your answer correct to 3 significant figures.

..... $^{\circ}\text{C}$

(Total 4 marks)

Q10



6.

(a) Simplify $m^3 \times m^6$

.....
(1)

(b) Simplify $\frac{p^8}{p^2}$

.....
(1)

(c) Simplify $(2n^3)^4$

.....
(2)

(Total 4 marks)

Q11

7. , $-2 \leq n < 5$
 n is an integer.

(a) Write down all the possible values of n .

.....
(2)

(b) Solve the inequality $4x + 1 > 11$

.....
(2)

(Total 4 marks)

Q12



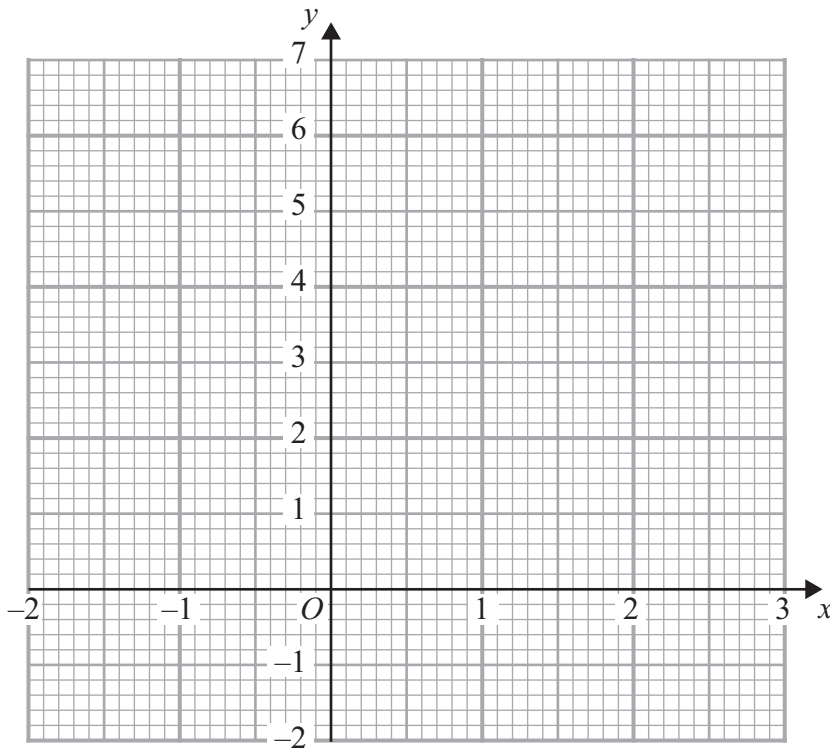
8.

(a) Complete the table of values for $3x + 2y = 6$

x	-2	-1	0	1	2	3
y		4.5	3			-1.5

(2)

(b) On the grid, draw the graph of $3x + 2y = 6$



(2)

(c) Find the gradient of the graph of $3x + 2y = 6$

.....
(2)

(Total 6 marks)

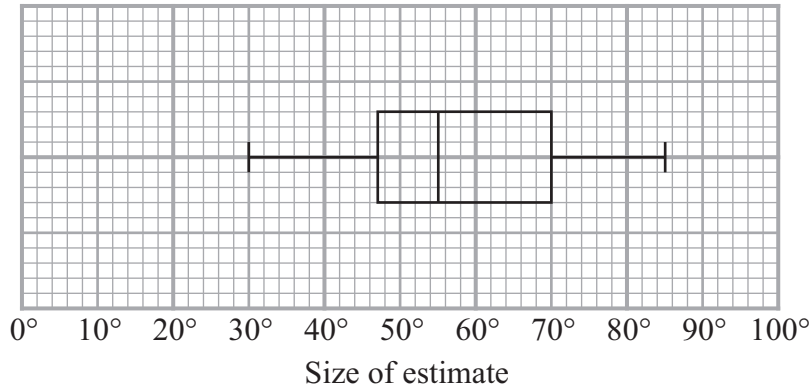
Q13



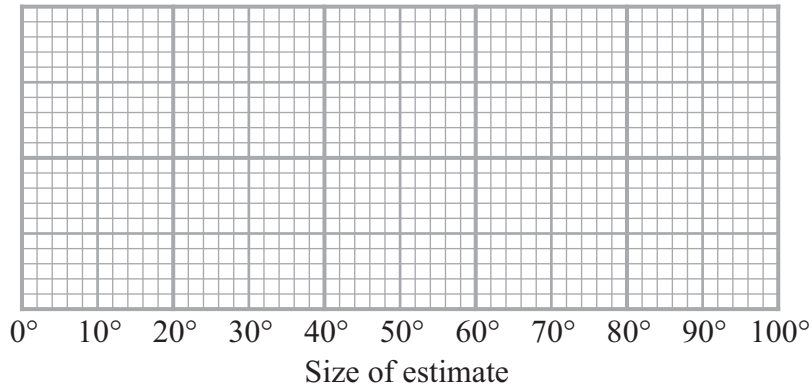
9.

Barry drew an angle of 60° .
 He asked some children to estimate the size of the angle he had drawn.
 He recorded their estimates.
 The box plot gives some information about these estimates.

Children's estimates



Adults' estimates



(a) Write down the median of the children's estimates.

.....
 (1)

(b) Find the interquartile range of the children's estimates.

.....
 (2)



Barry then asked some adults to estimate the size of the angle he had drawn. The table gives some information about the adults' estimates.

	Angle
Lowest estimate	20°
Lower quartile	45°
Median	62°
Upper quartile	75°
Highest estimate	95°

(c) On the grid opposite, draw a box plot to show this information.

(2)

(d) Use the two box plots, to compare the distribution of the children's estimates with the distribution of the adults' estimates.

.....

.....

.....

.....

(2)

(Total 7 marks)

Q16



10.

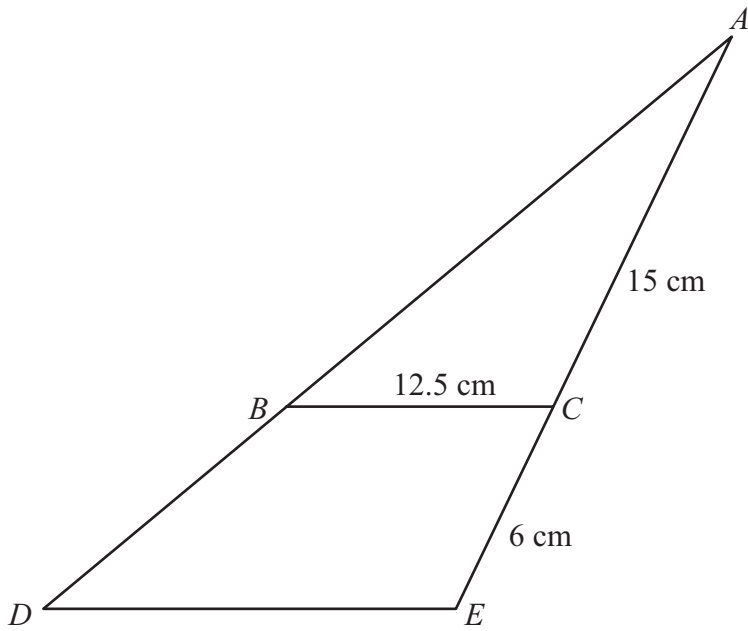


Diagram **NOT** accurately drawn

Triangle ABC is similar to triangle ADE .
 $AC = 15$ cm.
 $CE = 6$ cm.
 $BC = 12.5$ cm.

Work out the length of DE .

..... cm

(Total 3 marks)

Q17

11. Change 9 cm^2 to mm^2 .

..... mm^2

(Total 2 marks)

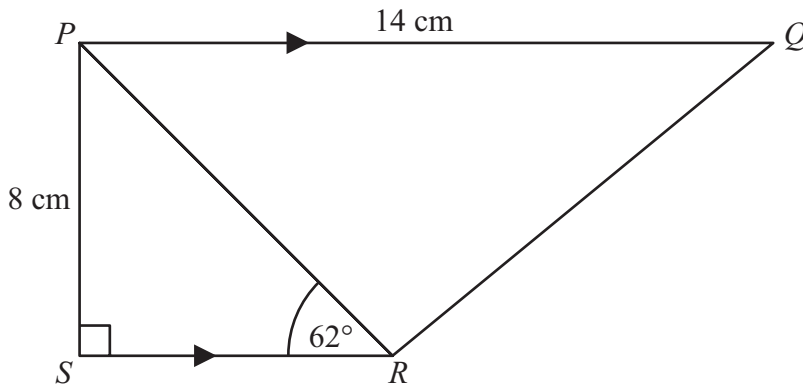
Q18



12.

Leave blank

Diagram **NOT** accurately drawn



$PQRS$ is a trapezium.
 PQ is parallel to SR .
Angle $PSR = 90^\circ$.
Angle $PRS = 62^\circ$.
 $PQ = 14$ cm.
 $PS = 8$ cm.

- (a) Work out the length of PR .
Give your answer correct to 3 significant figures.

..... cm
(3)

- (b) Work out the length of QR .
Give your answer correct to 3 significant figures.

..... cm
(4)

(Total 7 marks)

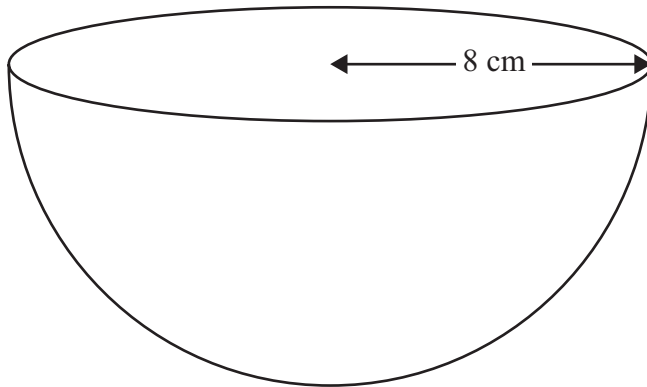
Q20



13.

The diagram shows a solid hemisphere of radius 8 cm.

Diagram **NOT** accurately drawn



Work out the total surface area of the hemisphere.
Give your answer correct to 3 significant figures.

..... cm²

(Total 3 marks)

Q24

