

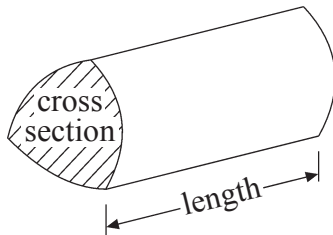
GCSE Mathematics (Linear) 1380

Formulae: Higher Tier



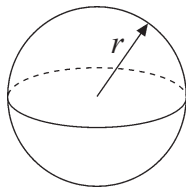
**You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.**

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



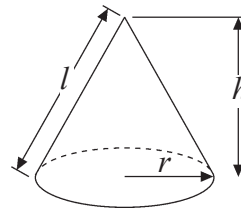
Volume of sphere = $\frac{4}{3}\pi r^3$

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

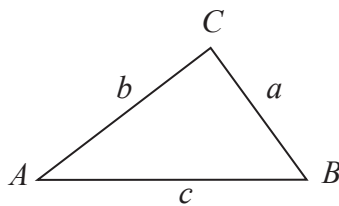


Volume of cone = $\frac{1}{3}\pi r^2 h$

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.

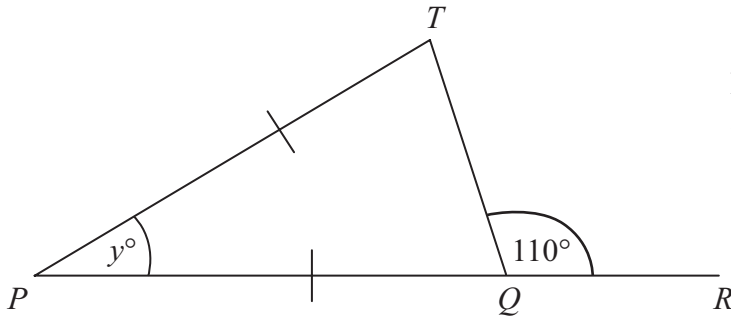


Diagram **NOT** accurately drawn

PQR is a straight line.
 $PT = PQ$.

(i) Work out the value of y .

.....

(ii) Give reasons for your answer.

.....
.....
.....

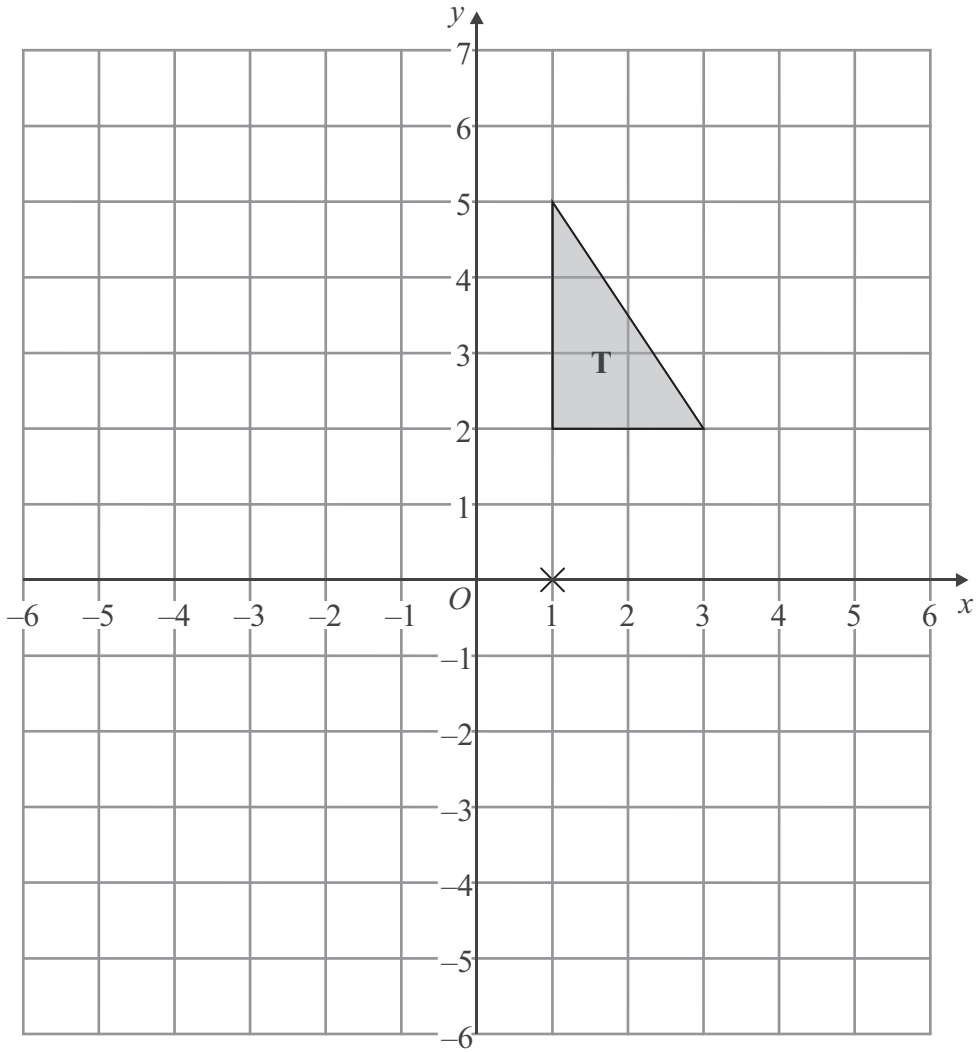
(Total 4 marks)

Q3



2.

Leave blank



Triangle **T** has been drawn on the grid.

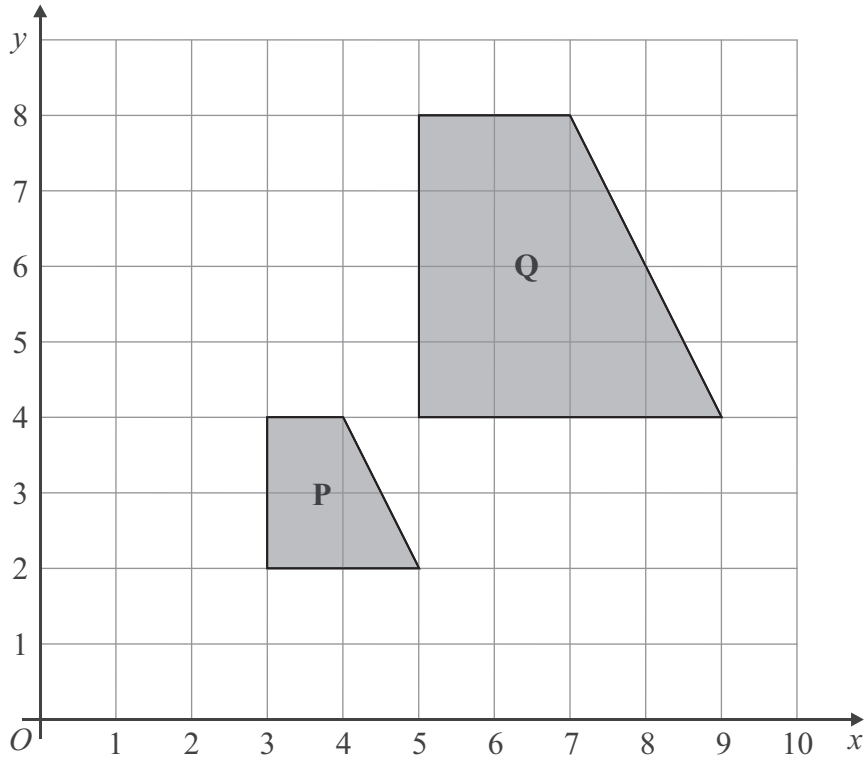
Rotate triangle **T** 180° about the point $(1, 0)$.
Label the new triangle **A**.

(Total 2 marks)

Q5



3.



Describe fully the single transformation which maps shape **P** onto shape **Q**.

.....
.....

(Total 3 marks)

Q6

4.

Anna and Bill share £40 in the ratio 2 : 3

Work out how much each person gets.

Anna £.....

Bill £.....

(Total 3 marks)

Q7



5.

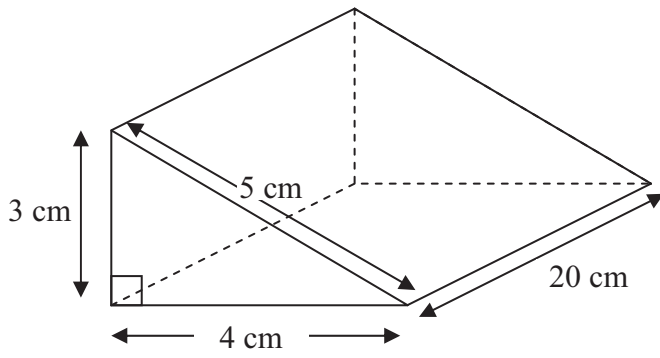


Diagram **NOT** accurately drawn

Work out the volume of the triangular prism.

..... cm³

(Total 2 marks)

Q9

6.

Work out 4.52×36

.....

(Total 3 marks)

Q10



7.

There are 300 people in the cinema.

$\frac{1}{6}$ of the 300 people are boys.

$\frac{3}{10}$ of the 300 people are girls.

The rest of the people are adults.

Work out how many people are adults.

.....

(Total 4 marks)

Q11

8.

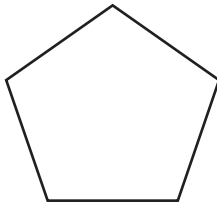


Diagram **NOT** accurately drawn

Work out the size of an exterior angle of a regular pentagon.

..... °

(Total 2 marks)

Q12



9.

(a) Factorise $3x + 12$

.....
(1)

(b) Solve $4(2x - 3) = 5x + 7$

$x =$
(3)

(c) Expand and simplify $(y + 4)(y + 5)$

.....
(2)

(d) Factorise fully $8x^2 + 12xy$

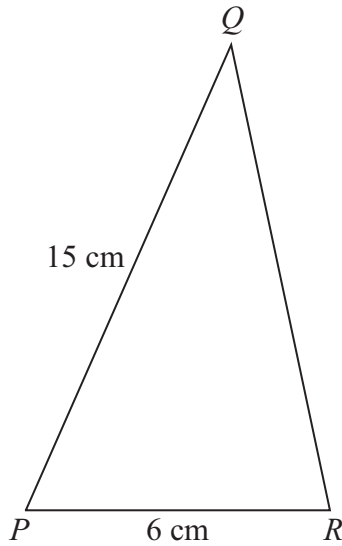
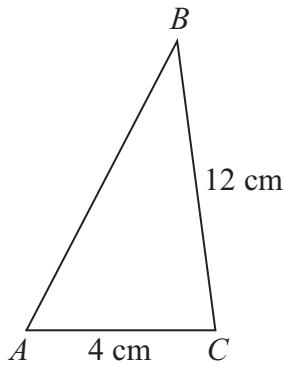
.....
(2)

(Total 8 marks)

Q17



10.



Diagrams **NOT** accurately drawn

Triangles ABC and PQR are mathematically similar.

Angle $A =$ angle P .

Angle $B =$ angle Q .

Angle $C =$ angle R .

$AC = 4 \text{ cm}$.

$BC = 12 \text{ cm}$.

$PR = 6 \text{ cm}$.

$PQ = 15 \text{ cm}$.

(a) Work out the length of QR .

..... cm
(2)

(b) Work out the length of AB .

..... cm
(2)

(Total 4 marks)

Q18



11. Solve the simultaneous equations

$$\begin{aligned} 3x + 2y &= 8 \\ 2x + 5y &= -2 \end{aligned}$$

$x = \dots\dots\dots$

$y = \dots\dots\dots$

(Total 4 marks)

Q21



12.

The table gives some information about the delays, in minutes, of 80 flights.

| Delay (n minutes) | Frequency |
|-------------------------|-----------|
| $0 < n \leq 20$ | 16 |
| $20 < n \leq 30$ | 26 |
| $30 < n \leq 40$ | 23 |
| $40 < n \leq 50$ | 10 |
| $50 < n \leq 60$ | 5 |

(a) Write down the modal class interval.

.....
(1)

(b) Complete the cumulative frequency table.

| Delay (n minutes) | Cumulative Frequency |
|-------------------------|-------------------------|
| $0 < n \leq 20$ | |
| $0 < n \leq 30$ | |
| $0 < n \leq 40$ | |
| $0 < n \leq 50$ | |
| $0 < n \leq 60$ | |

(1)

(c) On the grid opposite, draw a cumulative frequency graph for your table.

(2)

(d) Use your graph to find an estimate for

(i) the median delay,

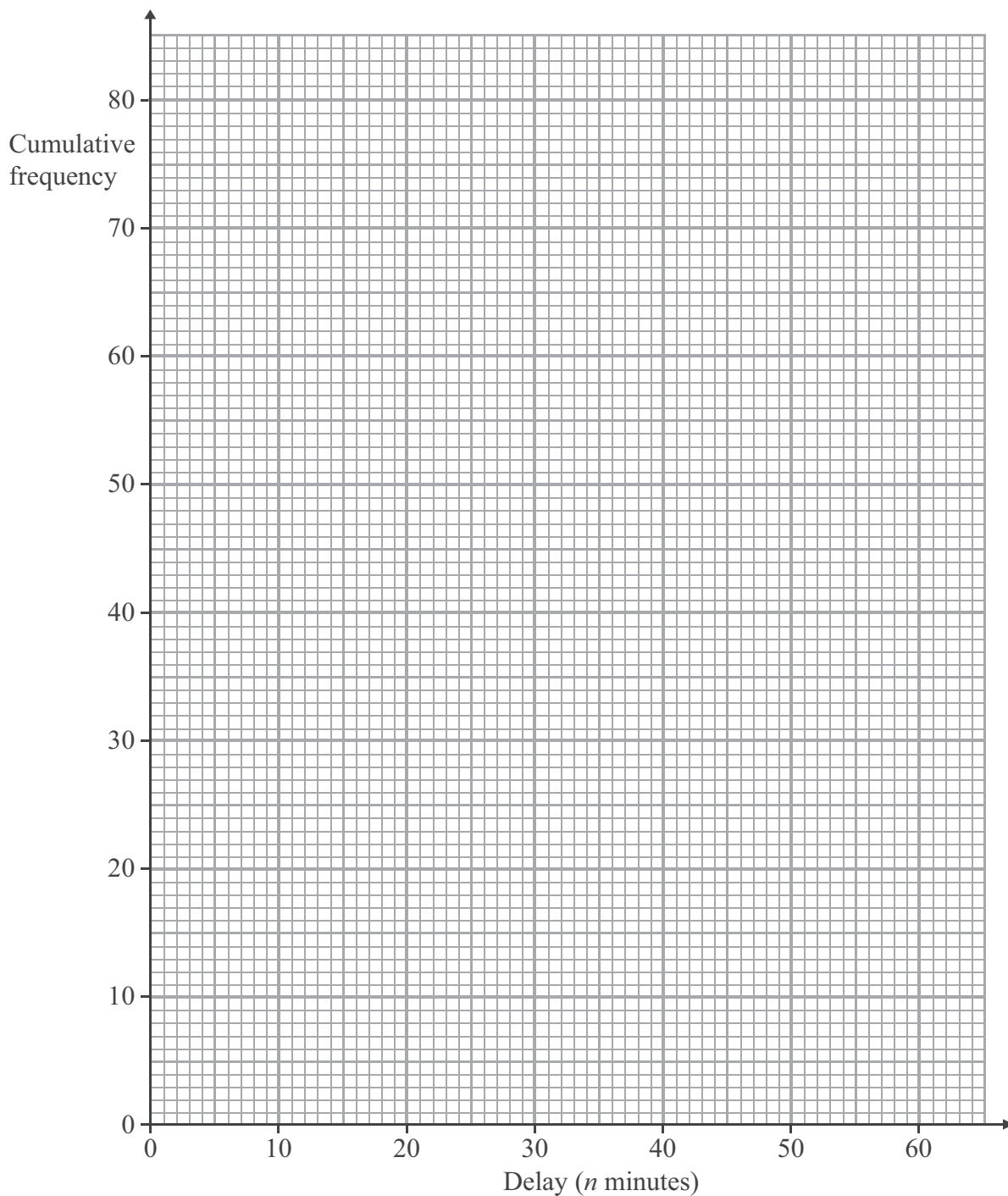
..... minutes

(ii) the interquartile range of the delays.

..... minutes

(3)





(Total 7 marks)

Q22



13.

There are 3 orange sweets, 2 red sweets and 5 yellow sweets in a bag.

Sarah takes a sweet at random.

She eats the sweet.

She then takes another sweet at random.

Work out the probability that both the sweets are the same colour.

.....

(Total 4 marks)

Q26

