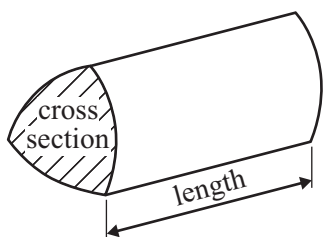


GCSE Mathematics (Linear) 1380

Formulae: Higher Tier

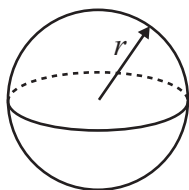
You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

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



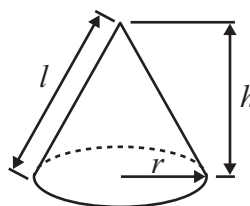
Volume of sphere = $\frac{4}{3}\pi r^3$

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

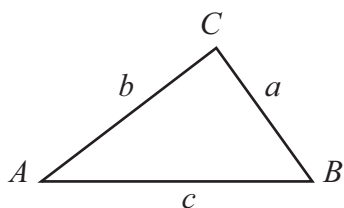


Volume of cone = $\frac{1}{3}\pi r^2 h$

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.

John needs 4 tyres for his car.

He pays for 3 tyres and gets one tyre free.
The tyres cost £65 each plus VAT at 20%.

Work out how much in total John pays for the tyres.

Offer of the week
4 for the price of 3



£65 each plus VAT

£

(Total 4 marks)

Q4

2.

(a) Use your calculator to work out $\frac{\sqrt{2.5^2 + 3.75}}{3.9 - 1.7}$

Write down all the figures on your calculator display.
You must give your answer as a decimal.

.....
(3)

(b) Write your answer to part (a) correct to 2 decimal places.

.....
(1)

(Total 4 marks)

Q5



3. The equation $x^3 + 3x = 41$

has a solution between 3 and 4

Use a trial and improvement method to find this solution.

Give your answer correct to one decimal place.

You must show **all** your working.

$x = \dots\dots\dots$

(Total 4 marks)

Q6



4.

(a) Simplify $x^5 \times x^4$

.....
(1)

(b) Simplify $y^7 \div y^2$

.....
(1)

(c) Expand and simplify $3(2a + 5) + 5(a - 2)$

.....
(2)

(d) Expand and simplify $(y + 5)(y + 7)$

.....
(2)

(e) Factorise $p^2 - 6p + 8$

.....
(2)

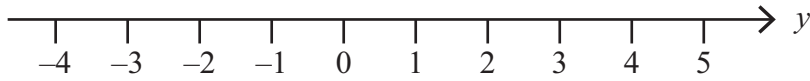
(Total 8 marks)

Q8



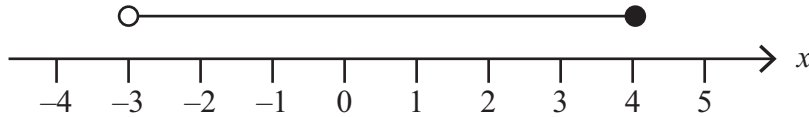
5.

(a) On the number line below, show the inequality $-2 < y < 3$



(1)

(b) Here is an inequality, in x , shown on a number line.



Write down the inequality.

.....
(2)

(c) Solve the inequality $4t - 5 > 9$

.....
(2)

(Total 5 marks)

Q11

6.

Sylvie shares £45 between Ann, Bob and Cath in the ratio 2 : 3 : 4

Work out the amount each person gets.

Ann

Bob

Cath

(Total 3 marks)

Q12



7.

$ABCD$ is a trapezium.

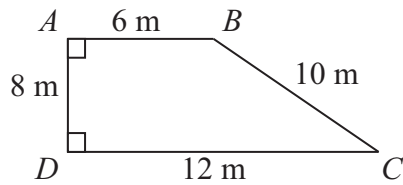


Diagram **NOT** accurately drawn

Work out the area of the trapezium.

..... m²

(Total 2 marks)

Q13

8.

PQR is a right-angled triangle.

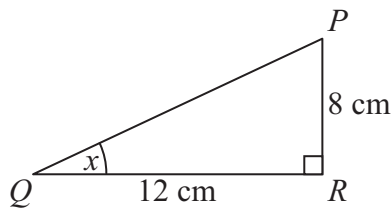


Diagram **NOT** accurately drawn

$PR = 8$ cm.

$QR = 12$ cm.

- (a) Find the size of the angle marked x .
Give your answer correct to 1 decimal place.

..... °

(3)



XYZ is a different right-angled triangle.

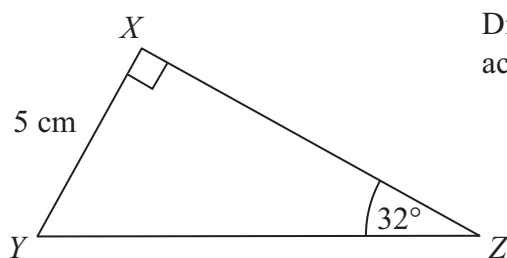


Diagram **NOT** accurately drawn

$XY = 5$ cm.
Angle $Z = 32^\circ$.

- (b) Calculate the length YZ .
Give your answer correct to 3 significant figures.

..... cm
(3)

(Total 6 marks)

Q14



9. This frequency table gives information about the ages of 60 teachers.

Age (A) in years	Frequency
$20 < A \leq 30$	12
$30 < A \leq 40$	15
$40 < A \leq 50$	18
$50 < A \leq 60$	12
$60 < A \leq 70$	3

- (a) Complete the cumulative frequency table.

Age (A) in years	Cumulative frequency
$20 < A \leq 30$	
$20 < A \leq 40$	
$20 < A \leq 50$	
$20 < A \leq 60$	
$20 < A \leq 70$	

(1)

- (b) On the grid opposite, draw a cumulative frequency graph for this information.

(2)

- (c) Use your cumulative frequency graph to find an estimate for the median age.

..... years
(2)

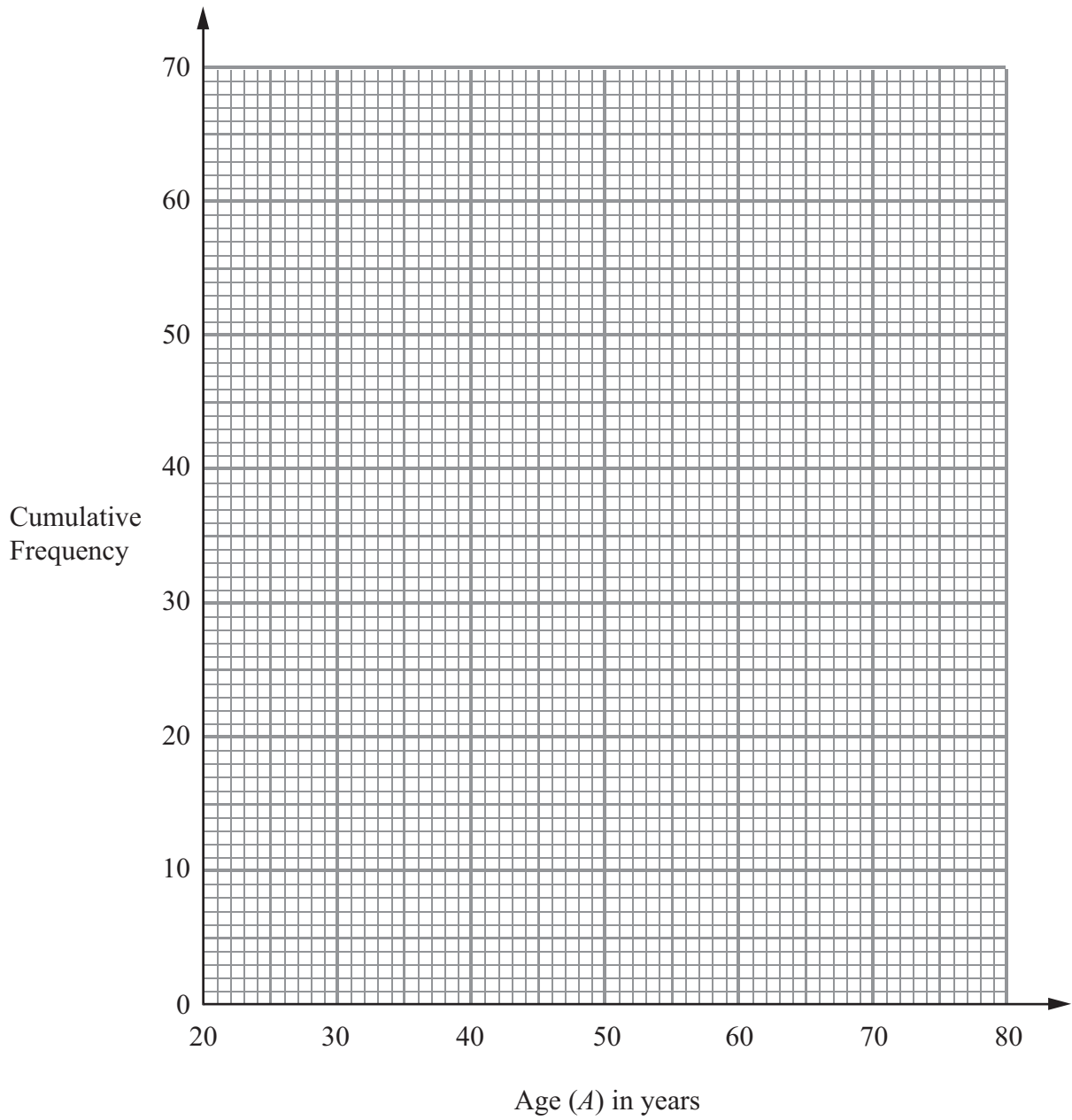
- (d) Use your cumulative frequency graph to find an estimate for the number of teachers older than 55 years.

.....
(2)



10.

Leave blank



(Total 7 marks)

Q16



11.

Solve the equations

$$\begin{aligned}3x + 5y &= 19 \\4x - 2y &= -18\end{aligned}$$

$x = \dots\dots\dots$

$y = \dots\dots\dots$

(Total 4 marks)

Leave
blank

Q18

12.

Solve the equation $5x^2 + 8x - 6 = 0$
Give each solution correct to 2 decimal places.

.....

(Total 3 marks)

Q19



13.

Here is a triangle ABC .

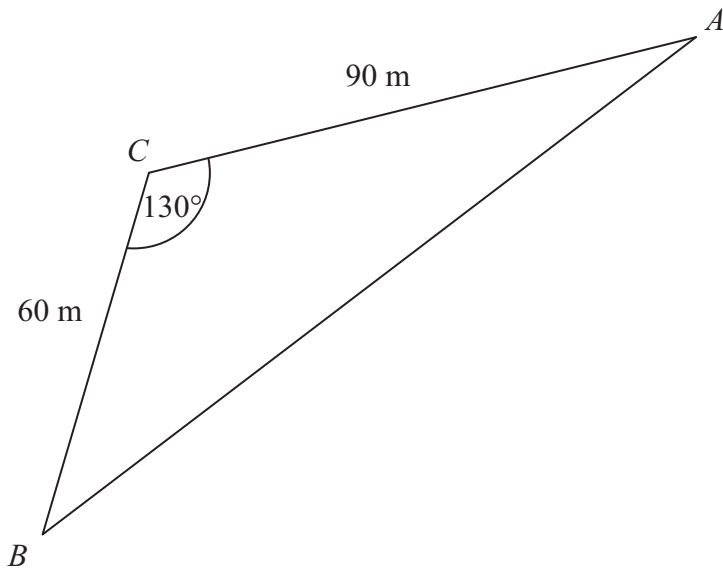


Diagram **NOT** accurately drawn

$AC = 90$ m.
 $BC = 60$ m.
Angle $ACB = 130^\circ$.

Calculate the perimeter of the triangle.
Give your answer correct to one decimal place.

..... m

(Total 4 marks)

Q20



14.

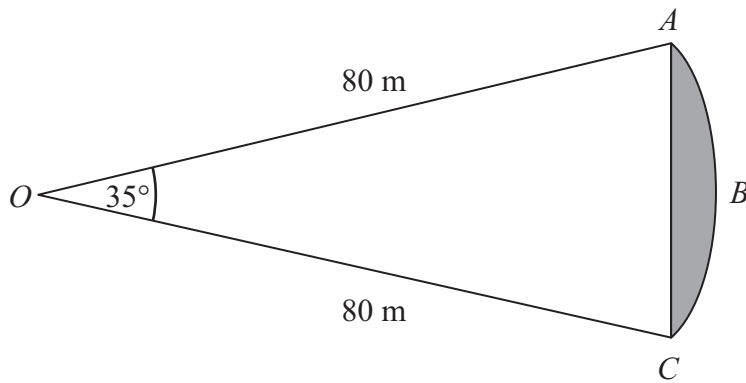


Diagram **NOT** accurately drawn

ABC is an arc of a circle centre O with radius 80 m.
 AC is a chord of the circle.
 Angle $AOC = 35^\circ$.

Calculate the area of the shaded region.
 Give your answer correct to 3 significant figures.

..... m²

(Total 5 marks)

Q23

