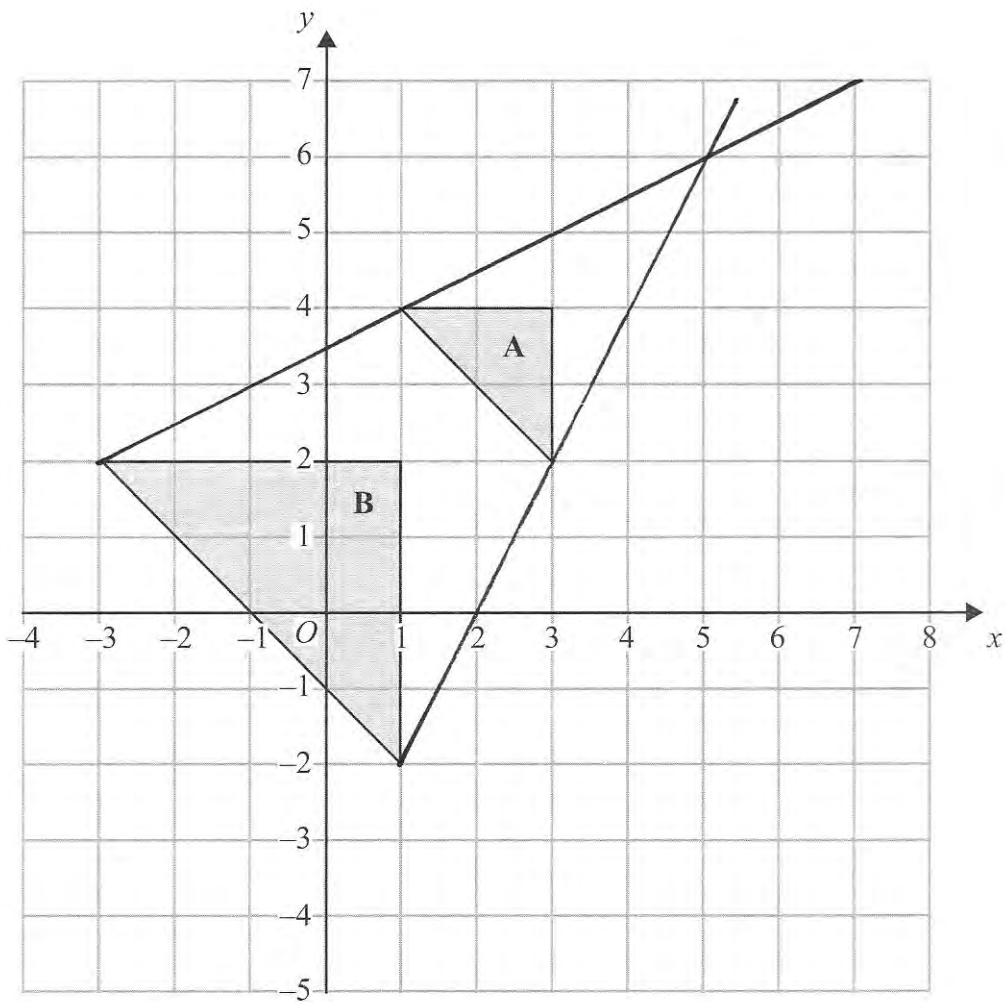


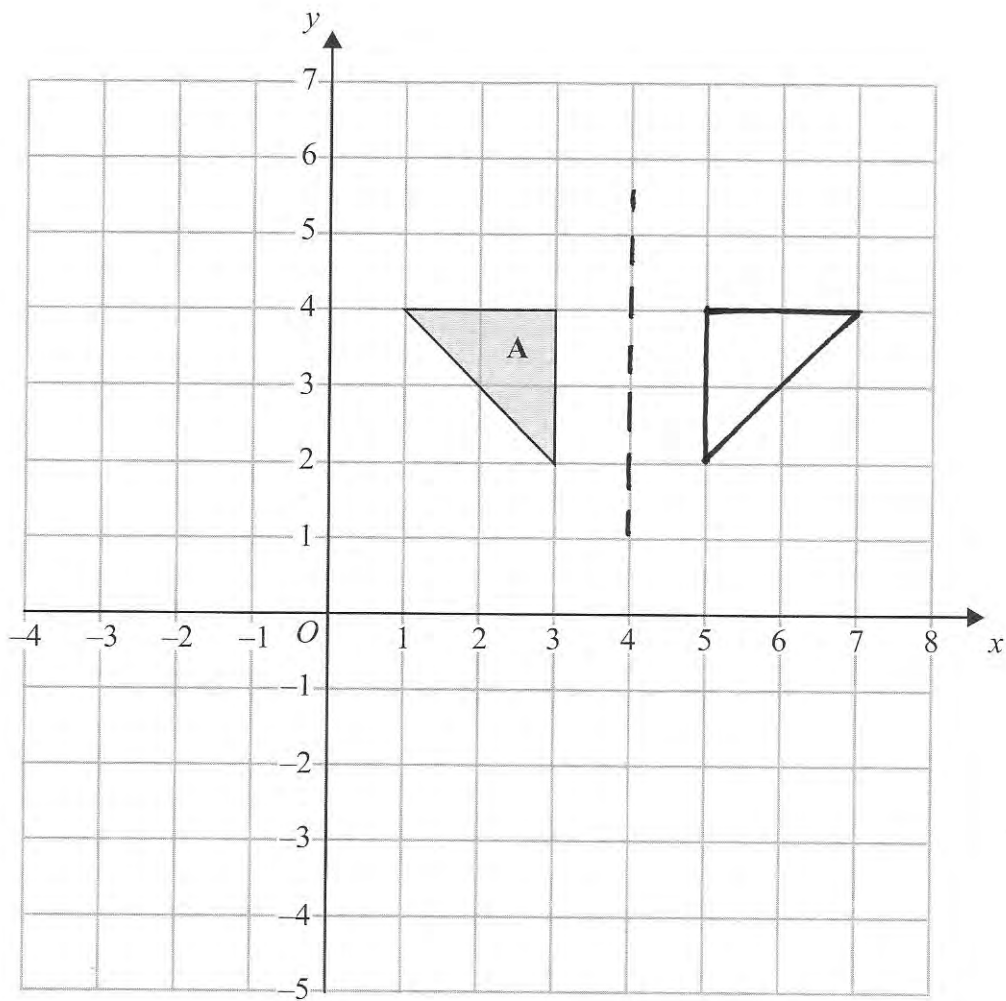
15.



Triangle **A** and triangle **B** are drawn on the grid.

(a) Describe fully the single transformation which maps triangle **A** onto triangle **B**.

enlargement, sf = 2, centre (5, 6)



(b) Reflect triangle **A** in the line $x = 4$

(2)

Q15

(Total 5 marks)

16. 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
$20 < A \leq 30$	12
$20 < A \leq 40$	27
$20 < A \leq 50$	45
$20 < A \leq 60$	57
$20 < A \leq 70$	60

(1)

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

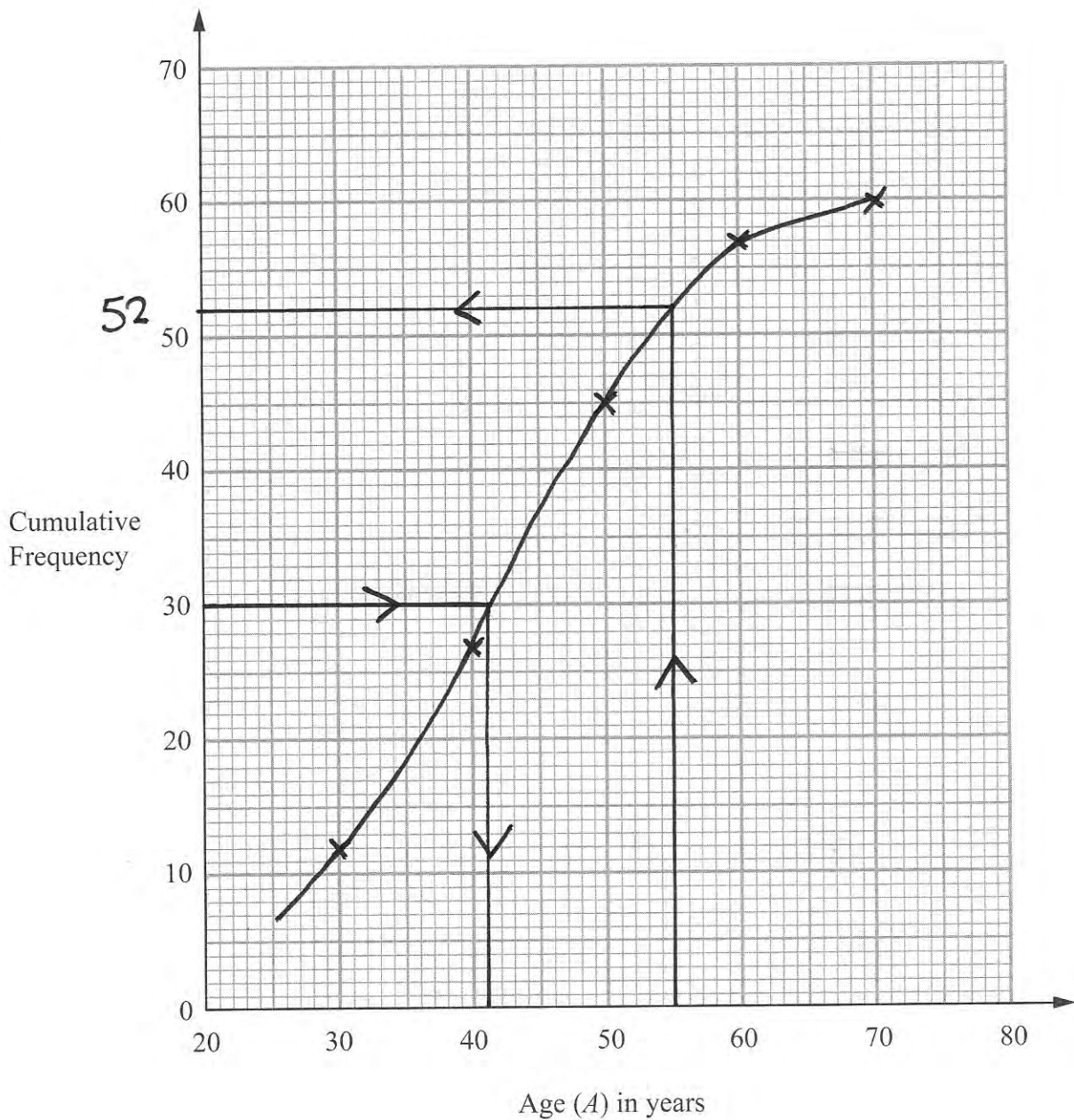
(2)

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

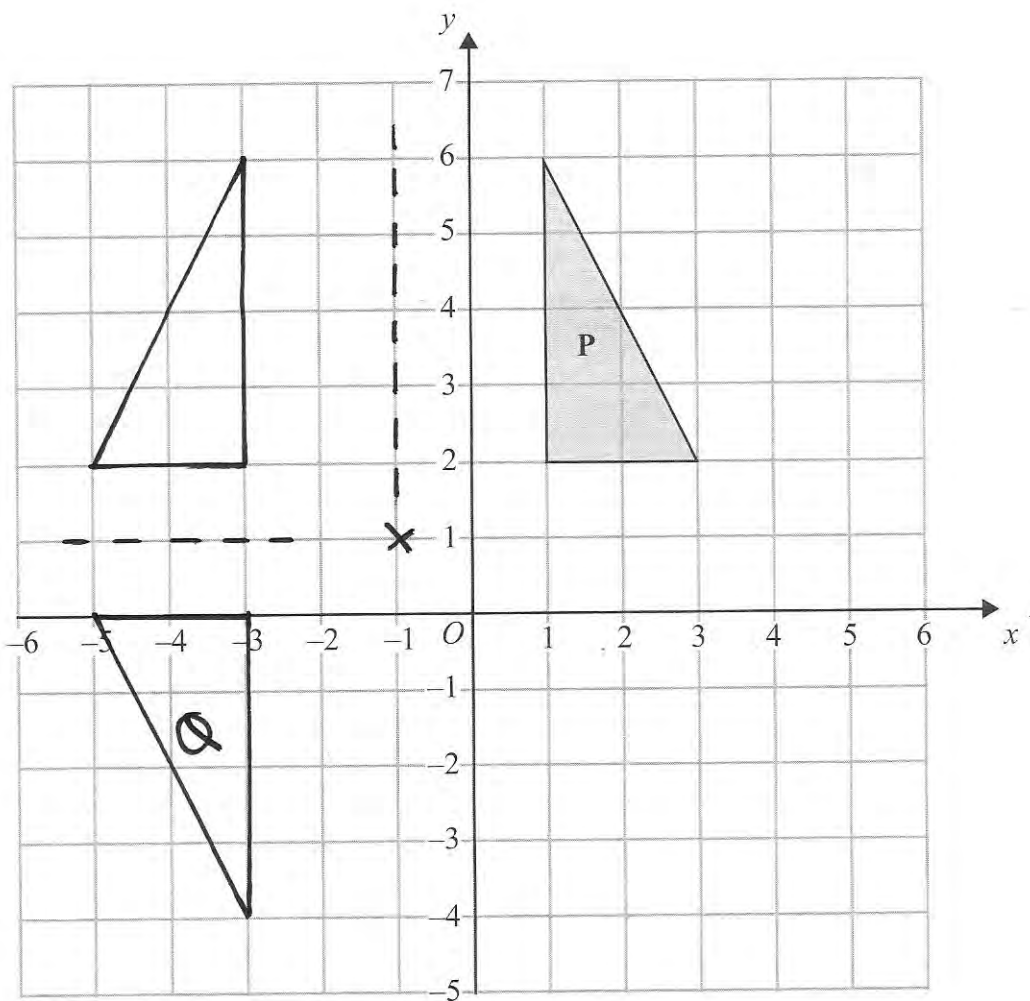
.....41..... years
(2)

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

60 - 528.....
(2)



17.



Triangle **P** is drawn on a coordinate grid.

The triangle **P** is reflected in the line $x = -1$ and then reflected in the line $y = 1$ to give triangle **Q**.

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

Rotation, 180° , about $(-1, 1)$

18. Solve the equations

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

$\times 2$

$\times 5$

$$\begin{array}{r} 6x + 10y = 38 \\ 20x - 10y = -90 \\ \hline \end{array} \quad +$$

$$26x = -52 \quad x = -2$$

$$4x - 2y = -18$$

$$-8 - 2y = -18$$

$$-2y = -10$$

$$y = 5$$

$$x = \underline{\underline{-2}}$$

$$y = \underline{\underline{5}}$$

(Total 4 marks)

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

$$a = 5 \quad b = 8 \quad c = -6$$

$$\frac{-8 \pm \sqrt{8^2 - 4 \times 5 \times -6}}{2 \times 5}$$

$$\underline{\underline{0.56, -2.16}}$$

(Total 3 marks)

20. Here is a triangle ABC .

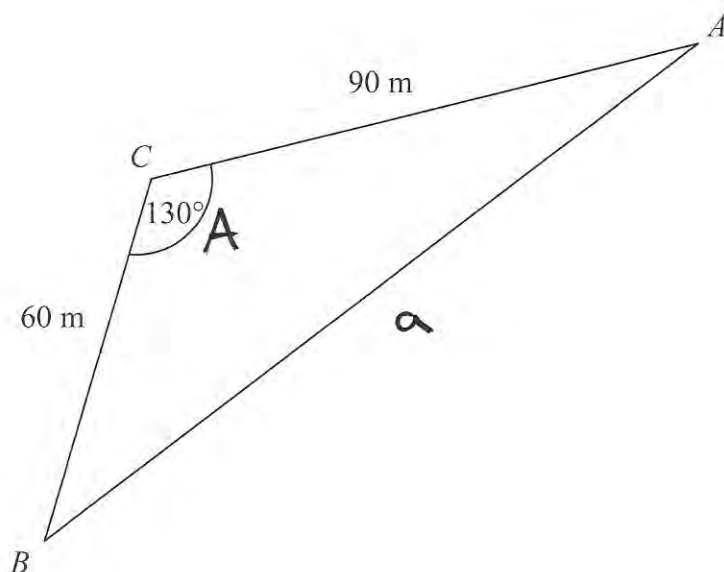


Diagram **NOT**
accurately drawn

$$AC = 90 \text{ m.}$$

$$BC = 60 \text{ m.}$$

$$\text{Angle } ACB = 130^\circ.$$

Calculate the perimeter of the triangle.

Give your answer correct to one decimal place.

$$a^2 = 60^2 + 90^2 - 2(60)(90) \cos 130$$

$$a^2 = 18642 \cdot 10618$$

$$a = 136.5$$

$$+ 60 + 90$$

$$\underline{286.5} \text{ m}$$

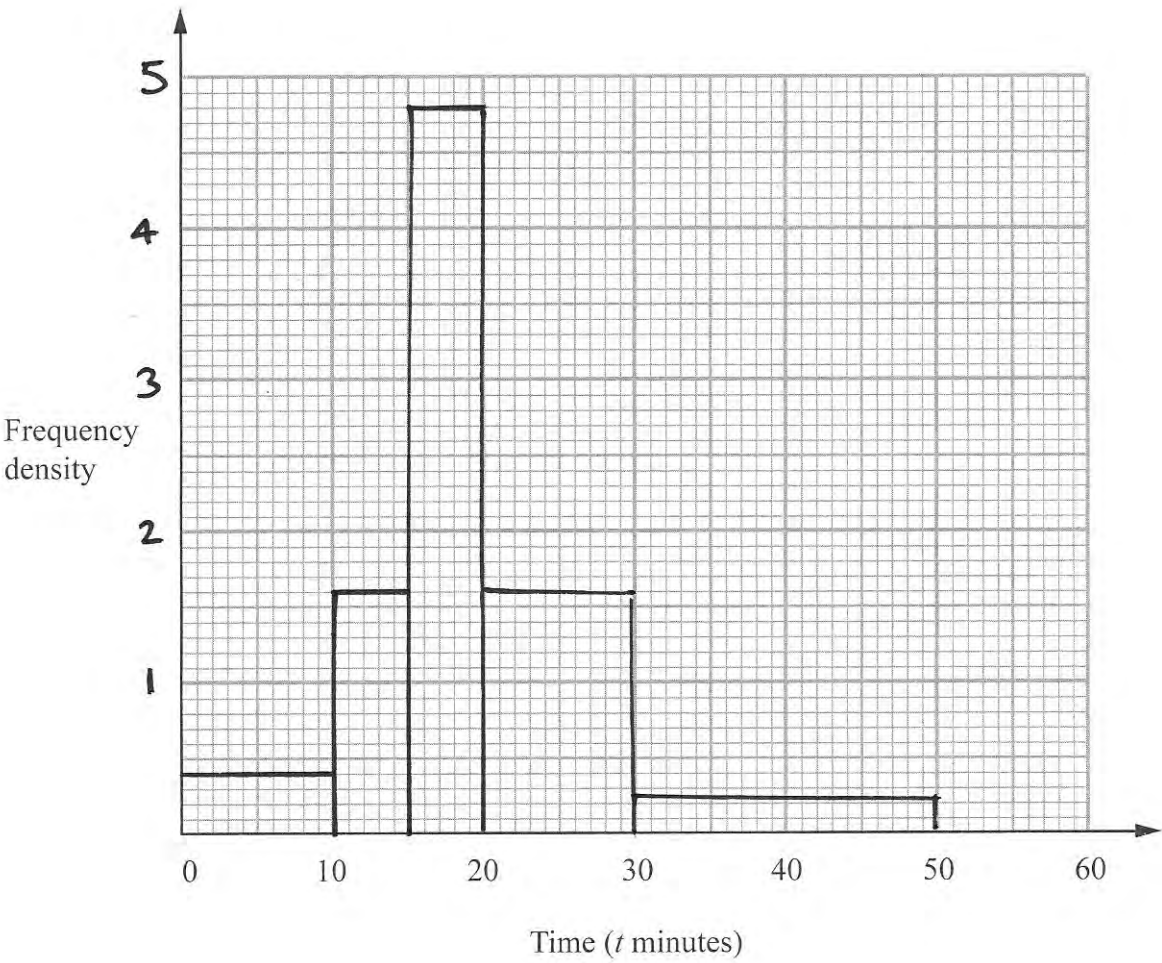
(Total 4 marks)

21. The table shows information about the lengths of time, t minutes, it took some students to do their maths homework last week.

Time (t minutes)	Frequency
$0 < t \leq 10$	4
$10 < t \leq 15$	8
$15 < t \leq 20$	24
$20 < t \leq 30$	16
$30 < t \leq 50$	5

CW	f.d.
10	0.4
5	1.6
5	4.8
10	1.6
20	0.25

Draw a histogram for this information.



22. The average fuel consumption (c) of a car, in kilometres per litre, is given by the formula

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

where d is the distance travelled, in kilometres, and f is the fuel used, in litres.

$d = 163$ correct to 3 significant figures.

$f = 45.3$ correct to 3 significant figures.

By considering bounds, work out the value of c to a suitable degree of accuracy.
You must show **all** of your working **and** give a reason for your final answer.

$$162.5 \leq d < 163.5$$

$$45.25 \leq f < 45.35$$

$$\text{upper bound } c = \frac{163.5}{45.25} = 3.613259669$$

$$\text{lower bound } c = \frac{162.5}{45.35} = 3.5832414$$

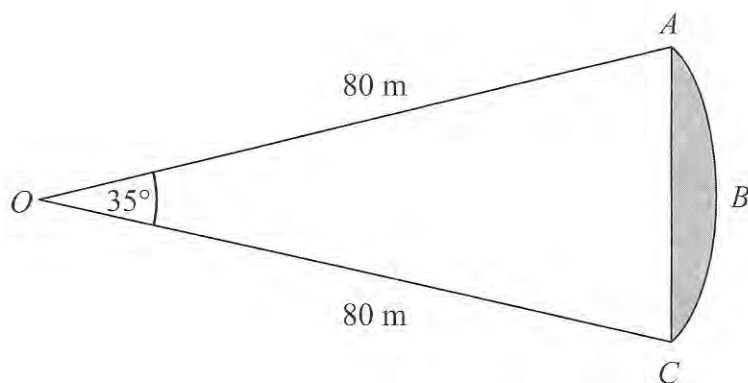
$$\therefore c = 3.6 \text{ (2sf)}$$

as both upper and lower bound
first round to the same value at
2sf.

$$c = \underline{3.6}$$

(Total 5 marks)

23.

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.

$$\text{area of Sector} = \frac{35}{360} \times \pi \times 80^2 = 1954.769$$

$$\begin{aligned} \text{area of triangle} &= \frac{1}{2} \times 80 \times 80 \times \sin 35 \\ &= 1835.4446 \end{aligned}$$

$$\begin{aligned} \therefore \text{area of Segment} &= 1954.769 \dots \\ &- 1835.4446 \dots \\ &\hline &119.324 \end{aligned}$$

119 m²

(Total 5 marks)

24. Solve

$$\frac{5(2x+1)^2}{4x+5} = 5x-1$$



$$5(2x+1)(2x+1) = (5x-1)(4x+5)$$

$$5[4x^2 + 4x + 1] = 20x^2 + 25x - 4x - 5$$

$$20x^2 + 20x + 5 = 20x^2 + 21x - 5$$

$$\Rightarrow \underline{x=10}$$

10

(Total 5 marks)

TOTAL FOR PAPER: 100 MARKS

END

Q24