

$$4(2) + 1\left(2\frac{1}{2}\right) + 4(2) = 9(y)$$

$$\Rightarrow y = \frac{37}{18}$$

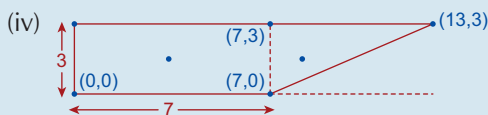
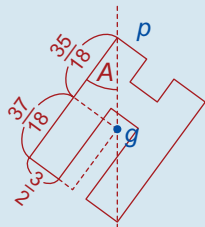
Answer: $\left(\frac{3}{2}, \frac{37}{18}\right)$

$$\tan A = \frac{\frac{3}{2}}{\frac{35}{18}}$$

$$= \frac{27}{35}$$

$$= 0.7714$$

$$\therefore A = 37^\circ 39'$$



Triangle piece:

Centroid is at

$$\left(\frac{7 + 7 + 13}{3}, \frac{3 + 3 + 0}{3}\right) = (9, 2)$$

Area is $\frac{1}{2}(6)(3) = 9$ square units

$$21 \text{ at } \left(3\frac{1}{2}, 1\frac{1}{2}\right) \left. \vphantom{21} \right\} = 30 \text{ at } (x, y)$$

$$9 \text{ at } (9, 2)$$

$$21\left(3\frac{1}{2}\right) + 9(9) = 30(x)$$

$$\Rightarrow x = 5.15$$

$$21\left(1\frac{1}{2}\right) + 9(2) = 30(y)$$

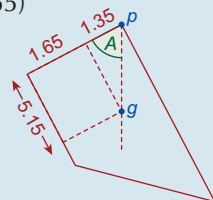
$$\Rightarrow y = 1.65$$

Answer: (5.15, 1.65)

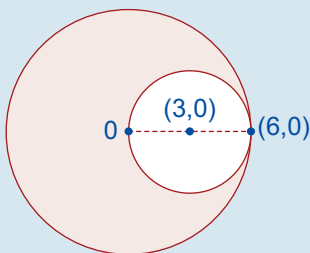
$$\tan A = \frac{5.15}{1.35}$$

$$= 3.8148$$

$$A = 75^\circ 19'$$



Q. 2.



Larger Circle: Area = 36π , Centre = (0, 0)

Smaller Circle: Area = 9π , Centre = (3, 0)

Remainder: Area = 27π ,
Centre of gravity is at (x, y)

$$\left. \begin{array}{l} 9\pi \text{ at } (3, 0) \\ 27\pi \text{ at } (x, y) \end{array} \right\} = 36\pi \text{ at } (0, 0)$$

$$\therefore 9\pi(3) + 27\pi(x) = 36\pi(0) \Rightarrow x = -1$$

$$9\pi(0) + 27\pi(y) = 36\pi(0) \Rightarrow y = 0$$

The distance (0, 0) to (-1, 0)

Answer: 1 cm

Q. 3. Full Square: Area = $4 \times 4 = 16 \text{ m}^2$

Small Square: Area = $1 \times 1 = 1 \text{ m}^2$

Remainder: Area = $16 - 1 = 15 \text{ m}^2$

$$1 \text{ at } (3.5, 3.5) \left. \vphantom{1} \right\} = 16 \text{ at } (2, 2)$$

$$15 \text{ at } (x, y)$$

$$1(3.5) + 15(x) = 16(2)$$

$$\Rightarrow 3.5 + 15x = 32$$

$$\Rightarrow 15x = 28.5$$

$$\Rightarrow x = 1.9$$

$$1(3.5) + 15(y) = 16(2)$$

$$\Rightarrow y = 1.9$$

\Rightarrow Centre of gravity of the remainder is at (1.9, 1.9)

Q. 4. (i) $\left(\frac{1 + 3 + 5}{3}, \frac{1 + 5 + 0}{3}\right) = (3, 2)$

(ii) $\left(\frac{1 + 9 + 11}{3}, \frac{2 + 6 + 1}{3}\right) = (7, 3)$

(iii) **Square:** Centre of gravity is at (1.5, 1.5)

Area of square = $3 \times 3 = 9$

Triangle: Centre of gravity is at

$$\left(\frac{3 + 3 + 9}{3}, \frac{0 + 3 + 0}{3}\right) = (5, 1)$$

Area of triangle = $\frac{1}{2}(6)(3) = 9$

$$9 \text{ at } (1.5, 1.5) \left. \vphantom{9} \right\} = 18 \text{ at } (x, y)$$

$$9 \text{ at } (5, 1)$$

$$9(1.5) + 9(5) = 18(x)$$

$$\Rightarrow 18x = 58.5$$

$$\Rightarrow x = 3.25$$

$$9(1.5) + 9(1) = 18(y)$$

$$\Rightarrow 18y = 22.5$$

$$\Rightarrow y = 1.25$$

\Rightarrow Centre of gravity of lamina is at (3.25, 1.25)