

Centre of gravity is at

$$\left(\frac{8 + 10 + 10}{3}, \frac{0 + 0 + 3}{3} \right) = \left(\frac{28}{3}, 1 \right)$$

Rectangle: Area = $10 \times 6 = 60$

Centre of gravity is at (5, 3)

Remainder C: Area = $60 - 6 - 3 = 51$.

Centre of gravity is at (x, y)

$$\left. \begin{array}{l} 6 \text{ at } \left(9, 4\frac{1}{2} \right) \\ 3 \text{ at } \left(\frac{28}{3}, 1 \right) \\ 51 \text{ at } (x, y) \end{array} \right\} = 60 \text{ at } (5, 3)$$

$$6(9) + 3\left(\frac{28}{3}\right) + 51(x) = 60(5)$$

$$\Rightarrow x = \frac{218}{51}$$

$$6\left(4\frac{1}{2}\right) + 3(1) + 51(y) = 60(3)$$

$$\Rightarrow y = \frac{150}{51}$$

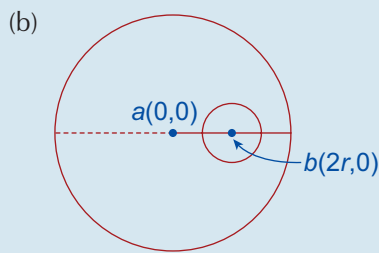
Answer: $\left(\frac{218}{51}, \frac{150}{51} \right) = (4.27, 2.94)$

Q. 8. (a) $4(2) + 5(x) + 1(5) + 3(1) = 13(2)$

$$\Rightarrow x = 2$$

$$4(3) + 5(4) + 1(y) + 3(7) = 13(4)$$

$$\Rightarrow y = -1$$



Larger circle: Area = πR^2

$$= \pi(4r)^2$$

$$= 16\pi r^2$$

Centre of gravity is at (0, 0)

Smaller Circle: Area = πr^2

Centre of gravity is at $b(2r, 0)$

Remainder: Area = $16\pi r^2 - \pi r^2$

$$= 15\pi r^2$$

Centre of gravity is at (x, y)

$$\left. \begin{array}{l} 15\pi r^2 \text{ at } (x, y) \\ \pi r^2 \text{ at } (2r, 0) \end{array} \right\} = 16\pi r^2 \text{ at } (0, 0)$$

$$15\pi r^2(x) + \pi r^2(2r) = 16\pi r^2(0)$$

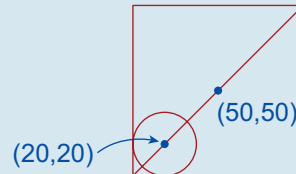
$$\Rightarrow x = -\frac{2r}{15}$$

$$15\pi r^2(y) + \pi r^2(0) = 16\pi r^2(0)$$

$$\Rightarrow y = 0$$

Answer: $\left(-\frac{2r}{15}, 0 \right)$

Q. 9.



Circle: Area = πr^2

$$= \frac{22}{7} \times \frac{400}{1}$$

$$= 1,257$$

Centre of gravity is at (20, 20)

Square: Area = 100×100

$$= 10,000$$

Centre of gravity is at (50, 50)

Remainder: Area = $10,000 - 1,257$

$$= 8,743$$

Centre of gravity is at (x, y)

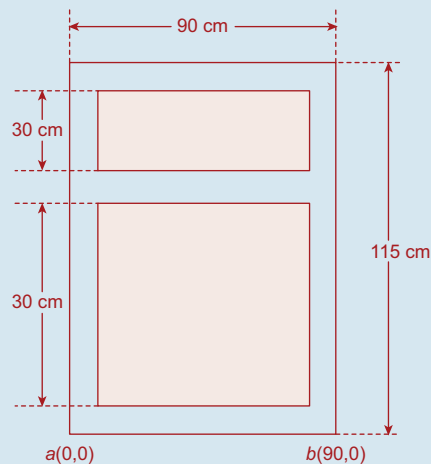
$$\left. \begin{array}{l} 1,257 \text{ at } (20, 20) \\ 8,743 \text{ at } (x, y) \end{array} \right\} = 10,000 \text{ at } (50, 50)$$

$$1,257(20) + 8,743(x) = 10,000(50)$$

$$\Rightarrow x = 54.3$$

Answer: 54 mm

Q. 10.



(i) Distance = $\frac{115}{2}$

$$= 57.5 \text{ cm}$$