

**Q. 12.** 
$$\left. \begin{array}{l} 3N \text{ at } \left(-\frac{7}{3}, 2\right) \\ 4N \text{ at } (1, 7) \\ 5N \text{ at } (3, 7) \\ 6N \text{ at } (4, -4) \end{array} \right\} = 18N \text{ at } (x, y)$$

$$3\left(-\frac{7}{3}\right) + 4(1) + 5(3) + 6(4) = 18(x)$$

$$\Rightarrow 18x = 36$$

$$\Rightarrow x = 2$$

$$3(2) + 4(7) + 5(7) + 6(-4) = 18(y)$$

$$\Rightarrow 18y = 45$$

$$\Rightarrow y = 2.5$$

$\Rightarrow$  Centre of gravity is at (2, 2.5)

**Q. 13.** 
$$\left. \begin{array}{l} 5 \text{ at } (3, -1) \\ 8 \text{ at } (4, 2) \\ 3 \text{ at } (-1, 5) \\ 2 \text{ at } (2, -6) \end{array} \right\} = 18 \text{ at } (x, y)$$

$$5(3) + 8(4) + 3(-1) + 2(2) = 18(x)$$

$$\Rightarrow 18x = 48$$

$$\Rightarrow x = \frac{8}{3}$$

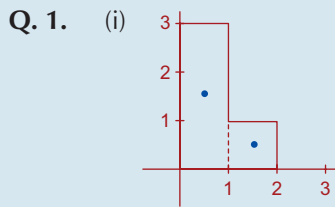
$$5(-1) + 8(2) + 3(5) + 2(-6) = 18(y)$$

$$\Rightarrow 18y = 14$$

$$\Rightarrow y = \frac{7}{9}$$

$\Rightarrow$  Centre of gravity is at  $\left(\frac{8}{3}, \frac{7}{9}\right)$

### Exercise 8C



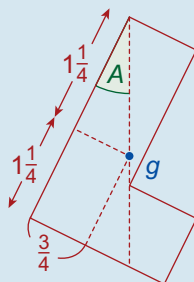
$$\left. \begin{array}{l} 3 \text{ at } \left(\frac{1}{2}, 1\frac{1}{2}\right) \\ 1 \text{ at } \left(1\frac{1}{2}, \frac{1}{2}\right) \end{array} \right\} = 4 \text{ at } (x, y)$$

$$3\left(\frac{1}{2}\right) + 1\left(1\frac{1}{2}\right) = 4x$$

$$\Rightarrow x = \frac{3}{4}$$

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

$$\Rightarrow y = 1\frac{3}{4}$$



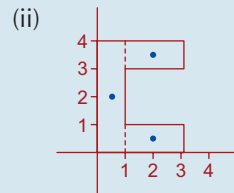
**Answer:**  $\left(\frac{3}{4}, 1\frac{1}{4}\right)$

$$\tan A = \frac{\frac{3}{4}}{1\frac{3}{4}}$$

$$= \frac{3}{7}$$

$$= 0.4286$$

$\therefore A = 23^\circ 12'$



$$\left. \begin{array}{l} 4 \text{ at } \left(\frac{1}{2}, 2\right) \\ 2 \text{ at } \left(2, \frac{1}{2}\right) \\ 2 \text{ at } \left(2, 3\frac{1}{2}\right) \end{array} \right\} = 8 \text{ at } (x, y)$$

$$4\left(\frac{1}{2}\right) + 2(2) + 2(2) = 8(x)$$

$$\Rightarrow x = 1\frac{1}{4}$$

$$4(2) + 2\left(\frac{1}{2}\right) + 2\left(3\frac{1}{2}\right) = 8(y)$$

$$\Rightarrow y = 2$$

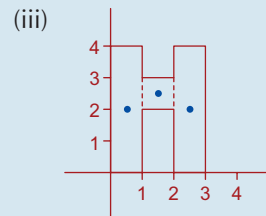
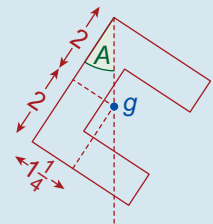
**Answer:**  $\left(1\frac{1}{4}, 2\right)$

$$\tan A = \frac{1\frac{1}{4}}{2}$$

$$= \frac{5}{8}$$

$$= 0.625$$

$\therefore A = 32^\circ$



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

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

$$\Rightarrow x = \frac{3}{2}$$