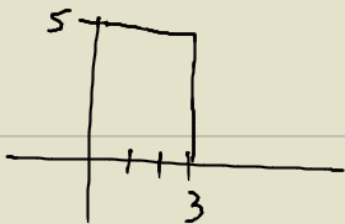


7.



$$I_x = \int_{x=0}^{x=3} \int_{y=0}^{y=5} y^2 (1) dy dx$$

$$= \int_{x=0}^{x=3} \left[\frac{1}{3} y^3 \right]_{y=0}^{y=5} dx$$

$$= \frac{1}{3} \int_{x=0}^{x=3} 125 dx$$

$$= \frac{125}{3} [x]_0^3$$

$$= \frac{125}{3} [3-0]$$

$$I_x = 125$$

$$m = \int_{x=0}^{x=3} \int_{y=0}^{y=5} 1 dy dx$$

$$= \int_{x=0}^{x=3} [y]_{y=0}^{y=5} dx$$

$$= \int_{x=0}^{x=3} 5 dx$$

$$= [5x]_{x=0}^{x=3}$$

$$m = 15$$

$$I_y = \int_{x=0}^{x=3} \int_{y=0}^{y=5} x^2 (1) dy dx$$

$$= \int_{x=0}^{x=3} [x^2 y]_{y=0}^{y=5} dx$$

$$= \int_{x=0}^{x=3} 5x^2 dx$$

$$= \left[\frac{5}{3} x^3 \right]_{x=0}^{x=3}$$

$$= \frac{5}{3} \cdot 27$$

$$= 45$$

$$\bar{x} = \sqrt{\frac{I_y}{m}}$$

$$\bar{x} = \sqrt{\frac{45}{15}}$$

$$= \sqrt{3}$$

$$\bar{y} = \sqrt{\frac{I_x}{m}}$$

$$= \sqrt{\frac{125}{15}}$$

$$= \sqrt{\frac{25}{3}}$$

$$= \frac{5}{\sqrt{3}}$$

$$= \frac{5\sqrt{3}}{3}$$