

$$M_{yz} = K \int_{x=0}^{x=8} \left[12x(4 - \frac{1}{2}x) - \frac{3}{8}x^2(4 - \frac{1}{2}x) - \frac{3}{8}x(4 - \frac{1}{2}x)^2 \right] dx$$

$$= K \int_{x=0}^{x=8} \left[48x - 6x^2 - 6x^2 + \frac{3}{4}x^3 - \frac{3}{8}x(16 - 4x + \frac{1}{4}x^2) \right] dx$$

$$= K \int_{x=0}^{x=8} \left[48x - 12x^2 + \frac{3}{4}x^3 - 24x + 6x^2 - \frac{3}{8}x^3 \right] dx$$

$$= K \int_{x=0}^{x=8} \left[\frac{3}{8}x^3 - 6x^2 + 24x \right] dx$$

$$= K \left[\frac{3}{8} \cdot \frac{1}{4}x^4 - \frac{6}{3}x^3 + \frac{24}{2}x^2 \right]_{x=0}^{x=8}$$

$$= K \left[\frac{3}{32}x^4 - 2x^3 + 12x^2 \right]_{x=0}^{x=8}$$

$$= K \left[\frac{3}{32} \cdot 8^4 - 2(8)^3 + 12(8)^2 \right]$$

$$M_{yz} = 128K$$

$$\bar{X} = \frac{M_{yz}}{m} = \frac{128K}{64K} = 2$$