8. (CONT.)

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

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

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

$$m = K\left[24(8) - 3(8)^2 + \frac{1}{8}\cdot 8^3\right]$$

$$m = K\left[192 - 192 + 64\right]$$

$$m = 64K$$

$$M_{yz} = \int_{x=0}^{x=8}\int_{y=0}^{y=4-\frac{1}{2}x}\int_{z=0}^{z=12-\frac{3}{2}x-3y} x(K)\,dz\,dy\,dx$$

$$= K\int_{x=0}^{x=8}\int_{y=0}^{y=4-\frac{1}{2}x}\left[xz\right]_{z=0}^{z=12-\frac{3}{2}x-3y} dy\,dx$$

$$= K\int_{x=0}^{x=8}\int_{y=0}^{y=4-\frac{1}{2}x} x\left(12 - \frac{3}{2}x - 3y\right)dy\,dx$$

$$= K\int_{x=0}^{x=8}\int_{y=0}^{y=4-\frac{1}{2}x}\left(12x - \frac{3}{2}x^2 - 3xy\right)dy\,dx$$

$$= K\int_{x=0}^{x=8}\left[12xy - \frac{3}{2}x^2y - \frac{3}{2}xy^2\right]_{y=0}^{y=4-\frac{1}{2}x} dx$$

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