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$$\begin{aligned} R &= \int_0^4 \frac{1}{2}(4-x)^2 dx \\ &= \frac{1}{2} \int_0^4 (16 - 8x + x^2) dx \\ &= \frac{1}{2} \left[ 16x - \frac{8}{2}x^2 + \frac{1}{3}x^3 \right]_0^4 \\ &= \frac{1}{2} \left[ 16(4) - 4(4)^2 + \frac{1}{3}(4)^3 \right] \\ &= 10.66 \text{ kN} \end{aligned}$$

location of resultant

$$\bar{x} = \frac{\int_L x w(x) dx}{\int_L w(x) dx}$$

$$\int_L x w(x) dx = \int_L x \cdot \frac{1}{2}(4-x)^2 dx$$