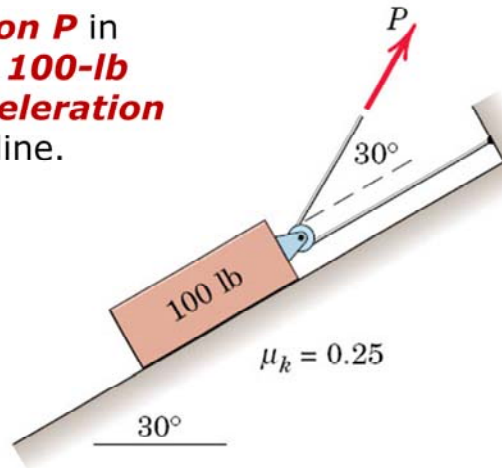


Rectilinear Motion: Yet Another Exercise

Determine the **tension P** in the cable to give the **100-lb** block a constant **acceleration** of **5 ft/s^2** up the incline.



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$a = 5 \text{ ft/sec}^2$

$\Sigma F_x = ma_x;$

$$P(1 + \cos 30^\circ) - 0.25N - 100 \sin 30^\circ = \frac{100}{32.2}(5)$$

$\Sigma F_y = 0; N + P \sin 30^\circ - 100 \cos 30^\circ = 0$

$$\left. \begin{aligned} 1.866P - 0.25N &= 65.53 \\ 0.5P + N &= 86.6 \end{aligned} \right\} \text{ solve simultaneously}$$

get $N = 64.7 \text{ lb}$

$P = 43.8 \text{ lb}$