

PROBLEM 1-5

Statement: A 250-lbm mass is accelerated at 40 in/sec². Find the force in lb needed for this acceleration.

Given: Mass $M := 250\text{ lb}$ Acceleration $a := 40 \cdot \frac{\text{in}}{\text{sec}^2}$

Solution: See Mathcad file P0105.

1. To determine the force required, multiply the mass value, in slugs, by the acceleration in feet per second squared:

$$\text{Convert mass to slugs: } M = 7.770 \cdot \text{slug}$$

$$\text{Convert acceleration to feet per second squared: } a = 3.333 \text{ s}^{-2} \cdot \text{ft}$$

$$F := M \cdot a \qquad F = 25.9 \cdot \text{lbf}$$