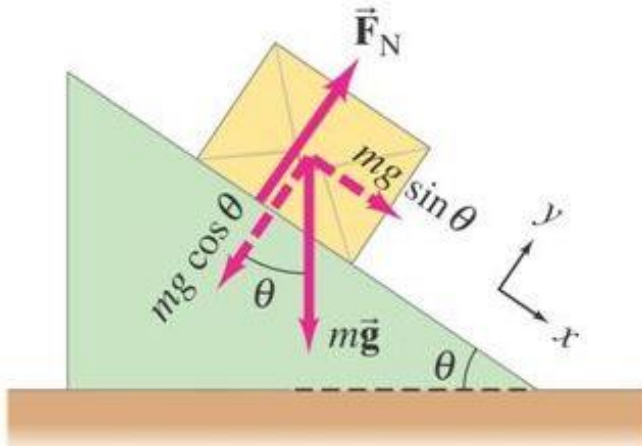


Answer on Question #70711 Physics / Other

A $m = 100$ lb box slides down a frictionless skid inclined at an angle of $\theta = 60$ degree with the horizontal. Find (a) the accelerating force F , (b) the time t_1 required to travel the first $v = 20$ ft/sec, and (c) the time t_2 required to travel the next 20 ft/sec.

Solution:



The acceleration force

$$\begin{aligned} F &= mg \sin \theta \\ &= 100 \times 32.174 \times \sin 60^\circ \\ &= 2786 \text{ lbf.} \end{aligned}$$

The acceleration

$$a = \frac{F}{m} = \frac{2786}{100} = 27.86 \text{ ft/sec}^2$$

The time required to travel

$$\begin{aligned} t_1 &= \frac{v - 0}{a} = \frac{20}{27.86} = 0.036 \text{ sec.} \\ t_2 &= \frac{2v - v}{a} = \frac{2 \times 20 - 20}{27.86} = 0.036 \text{ sec.} \end{aligned}$$

Answers:

- (a) $F = 2786$ lbf
- (b) $t_1 = 0.036$ sec
- (c) $t_2 = 0.036$ sec

Answer provided by <https://www.AssignmentExpert.com>