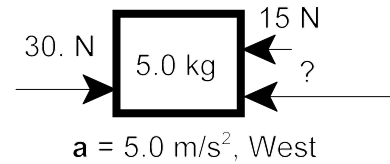


Extra Practice for Laws of Motion Quiz

Inquiry Physics

1. What is the magnitude of the missing force in the figure at right?



2. An object weighs 15.0 N on the moon, where the acceleration due to gravity is 1.60 m/s^2 . How much would that object weigh on the Earth?

3. A car decelerates from 20.0 m/s to a stop in 5.00 s . If the net force on the car was -5650 N , how much did the car weigh?

Solutions:

1. $\Sigma F = ma$ so $30 \text{ N} - 15 \text{ N} + F = (5 \text{ kg})(-5 \text{ m/s}^2)$ so $F = -25 \text{ N} + 15 \text{ N} - 30 \text{ N}$
so $F = -40 \text{ N}$ so $F = 40 \text{ N}$

2. $F_{\text{Earth}}^g = m g_{\text{Earth}}$ and we need mass.
 $m = F_{\text{Moon}}^g / g_{\text{Moon}} = 15 \text{ N} / 1.6 \text{ m/s}^2 = 9.375 \text{ kg}$
so then $F_{\text{Earth}}^g = (9.375 \text{ kg})(9.8 \text{ m/s}^2) = 91.875 \text{ N}$
 $\overline{91.9 \text{ N}}$

3. $F_g = m g$ but we don't know m , so find m using $\Sigma F = ma$.
 $\Sigma F = ma$ *horizontally* would be $-5650 \text{ N} = m (a_H)$ but we don't know a_H .
 $a_H = (v_f - v_i) / t = (0 - 20 \text{ m/s}) / 5 \text{ s} = -4 \text{ m/s}^2$
so then $-5650 \text{ N} = m (-4 \text{ m/s}^2)$ so $m = 1412.5 \text{ kg}$
so then $F_g = (1412.5 \text{ kg})(9.8 \text{ m/s}^2) = 13842.5 \text{ N}$
 $\overline{13,800 \text{ N}}$