

7.6

$$m = 1000 \text{ kg}$$

$$v_0 = 100 \frac{\text{km}}{\text{h}} \times \frac{1000 \text{ m}}{1 \text{ km}} \times \frac{1 \text{ h}}{3600 \text{ s}} = \frac{1000}{36} = 27.78 \frac{\text{m}}{\text{s}}$$

$$v_f = 0$$

$$x = 50 \text{ m}$$

$$F = ?$$

$$v_f^2 = v_0^2 + 2ax$$

$$0^2 = (27.78)^2 + 2a(50)$$

$$a = -\frac{(27.78)^2}{100} = 7.716 \text{ m/s}^2$$

$$F = ma$$

$$= (1000)(7.716) = \boxed{7716 \text{ N}}$$

7.7

$$W = ?$$

$$m = 4.8 \text{ kg}$$

$$W = mg$$

$$= (4.8)(9.8) = \boxed{47.0 \text{ N}}$$

$$W = 40 \text{ N}$$

$$m = ?$$

$$W = mg$$

$$40 = m(9.8)$$

$$m = \frac{40}{9.8} = \boxed{4.08 \text{ kg}}$$

7.9

$$W_e = 800 \text{ N}$$

$$W_m = 133 \text{ N}$$

$$g_m = ?$$

$$m_m = ?$$

$$m_e = ?$$

$$W_e = mg_e$$

$$800 = m(9.8)$$

$$m = \frac{800}{9.8} = \boxed{81.6 \text{ kg}}$$

(same on earth and moon)

$$W_m = mg_m$$

$$g_m = \frac{W_m}{m} = \frac{133}{81.6} = \boxed{1.63 \text{ m/s}^2}$$