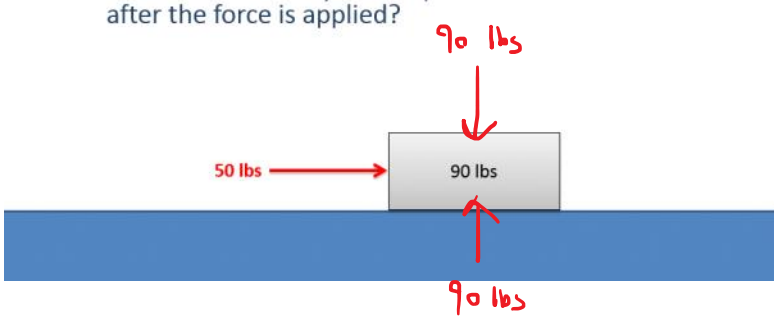
Problem 1

Force Method in One Dimension (Worked Example)

- A 90 lb block sits on a smooth surface as shown below. If a 50 lb force is applied as shown below...
  - What is the rate of acceleration of the block?
  - What is the velocity and displacement three seconds after the force is applied?



a)

$$\sum F_x = 50 \text{ lbs} = m a_x$$

$$50 = \frac{90}{32.2} a_x$$

$$\boxed{a_x = 17.89 \text{ ft/s}^2}$$

b)

$$V(t) = at + \cancel{V_0} = (17.89)(3)$$

$$\boxed{V(3) = 53.67 \text{ ft/s}}$$

$$S(t) = \frac{1}{2} a t^2 + \cancel{V_0 t} + \cancel{S_0} = \frac{1}{2}(17.89)(3)^2$$

$$\boxed{S(3) = 80.5 \text{ ft}}$$