

Warm up

- A person weighing 490 N stands on a scale in an elevator.
 - a) The elevator descends accelerating at 2.7 m/s^2 . What does the scale read?
 - b) Suppose the cable snapped and the elevator fell freely. What would the scale read?

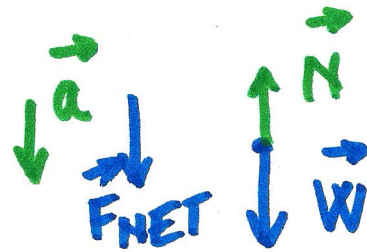
$$W = 490 \text{ N}$$

$$a) a_1 = 2.7 \text{ m/s}^2$$

$$b) a_2 = g = 9.81 \text{ m/s}^2$$

$$a) N_1 = ?$$

$$b) N_2 = ?$$



Newton's 2nd Law

$$F_{\text{NET}} = m \cdot a$$

$$F_{\text{NET}} = W - N$$

$N =$ apparent weight
 $=$ number given by the scale

$$N = W - F_{\text{NET}} = W - m \cdot a$$

$$W = m \cdot g \Rightarrow m = \frac{W}{g}$$

$$a) N_1 = 490 \text{ N} - \frac{490 \text{ N}}{9.81 \text{ m/s}^2} \cdot 2.7 \text{ m/s}^2$$

$$b) N_2 = 490 \text{ N} - \frac{490 \text{ N}}{9.81 \text{ m/s}^2} \cdot 9.81 \text{ m/s}^2$$

$$N_2 = 0 \text{ N}$$