

## Elevator Problem Notes

1. An elevator is moving up at a constant velocity of 6 m/s. Inside the elevator is a passenger that has a mass of 90 kg. Assume  $g = -10 \text{ m/s}^2$ .
  - a. Draw a force diagram for the PASSENGER, not the elevator.
  
  
  
  
  
  
  
  
  
  
  - b. Write the  $\sum F$  in terms of  $F_N$  and  $F_g$ .
  - c. Calculate force gravity in Newtons.  $F_g = mg$
  - d. Create a literal equation for  $F_N$  in terms of  $a$ ,  $g$  and mass.
  
  
  
  
  
  
  
  
  
  
  - e. What is the apparent weight of the passenger in Newtons? Units of g-force?
  
2. An elevator is moving up with a constant acceleration of +4 m/s/s. Inside the elevator is a passenger that has a mass of 90 kg. Assume  $g = -10 \text{ m/s}^2$ .
  - a. Draw a force diagram for the PASSENGER, not the elevator.
  
  
  
  
  
  
  
  
  
  
  - b. Write the  $\sum F$  in terms of  $F_N$  and  $F_g$ .
  - c. Calculate force gravity in Newtons.  $F_g = mg$
  - d. Calculate  $F_N$ .
  
  
  
  
  
  
  
  
  
  
  - e. What is the apparent weight of the passenger in Newtons? Units of g-force?

3. An elevator is moving down at a constant acceleration of  $-7 \text{ m/s/s}$ . Inside the elevator is a passenger that has a mass of  $90 \text{ kg}$ . Assume  $g = -10 \text{ m/s/s}$ .

a. Draw a force diagram for the PASSENGER, not the elevator.

b. Write the  $\sum F$  in terms of  $F_N$  and  $F_g$ .

c. Calculate force gravity in Newtons.  $F_g = mg$

d. Calculate  $F_N$ .

e. What is the apparent weight of the passenger in Newtons? Units of g-force?