


A 50 kg boy stands on a scale inside an elevator. Use  $g=10 \text{ m/s}^2$  to answer the following questions.

- 1) If the reading of the scale is 800 N, then the **magnitude** of the acceleration of the elevator is:

a)  $0 \text{ m/s}^2$   
 b)  $3 \text{ m/s}^2$   
 c)  $6 \text{ m/s}^2$   
 d)  $8 \text{ m/s}^2$   
 e)  $5 \text{ m/s}^2$



$$F_{\text{NET}} = F_N - mg = ma$$

$$800 \text{ N} - 500 \text{ N} = 50 a$$

$$a = \frac{300}{50} = 6 \text{ m/s}^2$$

- 2) If the reading of the scale is 100 N, then the **magnitude** of the acceleration of the elevator is:

a)  $0 \text{ m/s}^2$   
 b)  $3 \text{ m/s}^2$   
 c)  $6 \text{ m/s}^2$   
 d)  $8 \text{ m/s}^2$   
 e)  $5 \text{ m/s}^2$

$$F_N - mg = ma$$

$$100 - 500 = 50 a$$

$$a = -\frac{400}{50} = -8 \text{ m/s}^2 \text{ (moves down)}$$

- 3) If the reading of the scale is 500 N, then the **magnitude** of the acceleration of the elevator is:

a)  $0 \text{ m/s}^2$   
 b)  $3 \text{ m/s}^2$   
 c)  $6 \text{ m/s}^2$   
 d)  $8 \text{ m/s}^2$   
 e)  $5 \text{ m/s}^2$

$$F_N - mg = ma$$

$$500 \text{ N} - 500 \text{ N} = 50 a$$

$$\rightarrow a = 0 \text{ m/s}^2$$

- 4) A man sits on a table. If the table exerts a normal force on this man, what is the reaction of this normal force?

- a) The force of gravity exerted on this man.  
 b) The frictional force exerted on this man.  
 c) The force exerted by the table on the ground.  
 d) The force exerted by this man on the ground.  
 e) None of the above.

The force exerted  
by this man  
ON THE TABLE

Given the following three vectors:  $\vec{A} = 2\mathbf{i} + 3\mathbf{j} - \mathbf{k}$ ,  $\vec{B} = -5\mathbf{i} - 2\mathbf{j} + 3\mathbf{k}$ ,  $\vec{C} = -\mathbf{i} - \mathbf{j} - \mathbf{k}$ .