

Newton's 3rd Law: Elevators Review *Apparent Weight (ension)*

A 60.0 kg person on an elevator standing on a newton scale will have the scale read what when a) accelerating up at 2.0 m/s^2 b) going at a const. sp of 2.0 m/s c) accelerating down at 2.0 m/s^2 ?

a) $F_n = T - F_g$ *behavior*
 $T = F_n + F_g$
 $= ma + mg = 60(2.0 + 9.81)$
 $= 708.6 \text{ N}$ *App. mass = 72.23 kg*

b) const. sp $F_n = T - F_g$
 $a = 0$
 $F_n = 0$
 $F_g = T = 60(9.81) = 588.6 \text{ N}$

c) $F_n = F_g - T$
 $T = F_g - F_n = m(g - a)$
 $= 60(9.81 - 2.0)$
 $= 468.6 \text{ N}$
App. mass = $\frac{468.6 \text{ N}}{9.81} = 47.77 \text{ kg}$

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