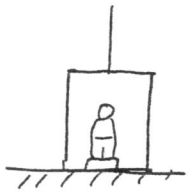
F = ma Worksheet II

(Review)

Do all work in your journal. Be sure to list givens and unknowns, draw an FBD, write an equation for net force, and solve in the appropriate format.

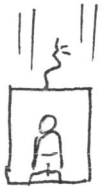
1. Oddly enough, a person with a mass of 60 kg is standing on a bathroom scale in an elevator. The scale reads the normal force acting on the person. What does it read when



   a) He is standing still on the first floor?

   b) The elevator is accelerating upward at 1.5 m/s2.

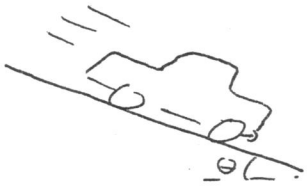
   c) He is traveling at a constant speed of 4 m/s upwards?



   d) He is decending with an acceleration of 2.0 m/s2?

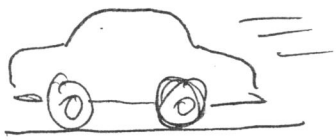
   e) He is in free fall after the elevator cable breaks?

2. A car that has a mass of 750 kg is rolling down a hill with an incline of 9 degrees. It slams on the brakes decelerating at a rate of 3.5 m/s2. What is the force of friction the brakes are exerting on the car?



3. A skier slides down a hill at an angle of 38 degrees. If he has a mass of 83 kg and the coefficient of friction is 0.17, what will his acceleration be?

4. A car that weighs 8000N is passing another car with an acceleration of 1.9 m/s2 . If friction provides a drag of 350 N, how much applied force must the engine be providing?



www.geniconsulting.org email: larrygeni@gmail.com

Helpful Hints

Use ***only*** when you are stumped. Pay attention to when you need help so you can ask good questions in class when we go over this.

① a) 

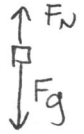
$\Sigma F = 0 = F_N - F_g$

b) 

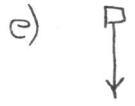
$\Sigma F = ma = F_N - F_g$

c) 

$\Sigma F = 0 = F_N - F_g$
(same as a))

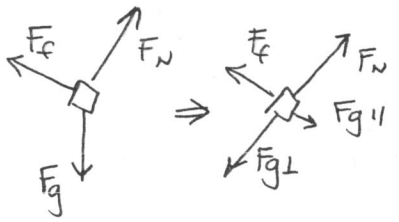
d) 

$\Sigma F = ma = F_g - F_N$

e) 

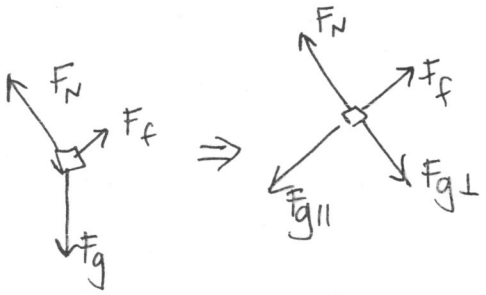
$\Sigma F = ma = F_g$

② $m = 750\,kg$
$\theta = 9°$
$a = 3.5 \frac{m}{s^2}$
$F_f = ?$



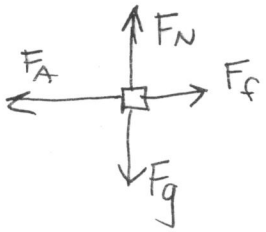
$\Sigma F_\perp = 0 = F_N - F_{g\perp}$
$\Sigma F_{11} = ma = F_f - F_{g11}$

③ $\theta = 38°$
$m = 83\,kg$
$\mu = 0.17$
$a = ?$



$\Sigma F_\perp = 0 = F_N - F_{g\perp}$
$\Sigma F_{11} = ma = F_{g11} - F_f$

④ ~~$F_g = 8000N$~~ $F_g = 8000N$
$a = 1.9 \frac{m}{s^2}$
$F_f = 350N$
$F_A = ?$



$\Sigma F_x = ma = F_A - F_f$

 www.geniconsulting.org email: larrygeni@gmail.com