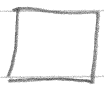
PHY 6.2

$\Sigma F = ma \quad a = \frac{F}{m}$

29.) 
78.4N 7.50kg $a = \frac{78.4N}{7.50kg} = 10.5\ m/s^2$

30.) $\Sigma F = ma \quad F_a = -F_F$

$\Sigma F = 0 \quad F_F = 30.N$


30.0N

12.0kg $mg = 12.0kg \cdot 9.80 m/s^2 = 118N$

$f_{kF} \frac{30.0N}{118N} = .254$

31.) 
4500kg $a\uparrow = 2.0 m/s^2$ $\Sigma F = ma \quad F_T + F_g = ma$

$F_T = ma - F_g = m(a-(-g))$

$F = 4500kg \cdot (2.0 m/s^2 - (-9.8 m/s^2)) = 5.3 \times 10^4 N$

32.) 
r.ps@250N

$\Sigma F = ma \quad F_T + F_g = ma \quad F_T < 250.N$

$a\uparrow = 5.0 m/s^2$

20.0kg groceries $F_T = ma - F_g = m(a-(-g))$

$F_T = 20.0kg(5.0 m/s^2 - (-9.8 m/s^2)) = 3.0 \times 10^2 N$

* Bag will break

33.) $\Sigma F = ma \quad F_a + F_F = ma \quad F_F = ma - F_a$


$v = 6.0 m/s^2$ 40.0N

5.0kg $f_f = (5.0kg)(6.0 m/s^2) - 40.0N$

$F_F = -10.N$

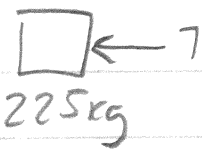
B) $F_f = \mu_K F_N = \mu mg$

$\mu_K = \frac{F_f}{mg} = \frac{-10N}{(5.0kg)(-9.80 m/s^2)} = .20$

PHy 6.2

$a = \frac{F_{NET}}{m}$ $\quad a = \frac{F_{net}}{m}$

$\mu = .20$ $\quad a = ?$ $\quad$ NEWTONS second LAW

34) 

$ma = F_{NET} = F_a - F_f$

$F_f = \mu mg$

$$a = \frac{F_a - \mu mg}{m}$$

$$a = \frac{710N - (.20)(225kg)(9.80 m/s^2)}{225kg} = 1.2 m/s^2$$

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35.) $\Sigma F = ma$ $\quad v^2 = v_0^2 + 2a(d - d_0)$

$v = 14.0 m/s$

$m = 2500.0 kg$ $\quad$ slide $d = 25.0 m$ $\quad F_f = \mu_K F_N = ma$ $\quad F_N = mg$

$$a = \frac{v^2 - v_0^2}{2(d - d_0)} = \frac{0 m/s^2 - 14.0 m/s^2}{2 \cdot (25.0m - 0m)} = -3.92 m/s^2 \qquad \mu_K = \frac{ma}{mg}$$

$$-\mu_K = \frac{-3.92 m/s^2}{9.80 m/s^2} = .400 \qquad -\mu_K = \frac{ma}{mg} = \frac{a}{g}$$

37.) $m = 50.0 kg$

$\mu F_S = .30$

$\mu F_K = .10$

a) $mg = 50.0kg \cdot 9.80 m/s^2 = 4.90 \times 10^2 N$

b) $\mu_S mg = 4.90 \times 10^2 N \cdot (.30) = 147 N$

c) $\mu_K mg = 4.90 \times 10^2 N \cdot (.1) = 49.0 N$

D.)

$\Sigma F = ma$

$F_a + F_f = ma$

$F_a = ma + F_f$

$= (50.0 kg)(3.0 m/s^2) + 49.0 N$

$= 199.0$

$= 2.0 \times 10^2 N$