Name: _____

Newton's Second Law

Read from **Lesson 3** of the **Newton's Laws** chapter at **The Physics Classroom**:

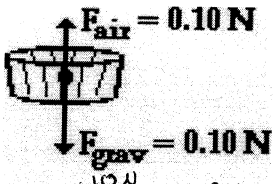
http://www.physicsclassroom.com/Class/newtlaws/u2l3c.html
http://www.physicsclassroom.com/Class/newtlaws/u2l3d.html

MOP Connection: Newton's Laws: sublevels 8 and 9

Free-body diagrams are shown for a variety of physical situations. Use Newton's second law of motion ($\Sigma F = m \bullet a$) to fill in all blanks. Use the approximation that g = ~10 m/s/s.

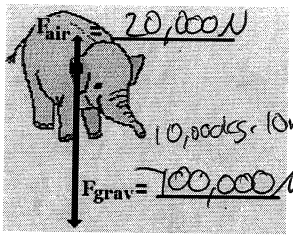
For All
$F = ma$
$Fw = m \cdot g$
$a = \frac{F_{net}}{m}$
$m = \frac{Fw}{g}$

a.



m= 1.0N / 10m/s² = .01kg
a= 0N / .01kg = 0m/s²
ΣF= 0N

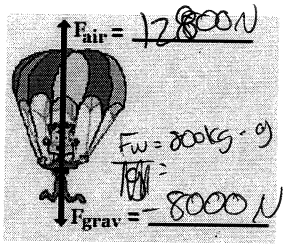
b.



m=10000 kg
a = 8.0 m/s/s, down
ΣF = 20,000N

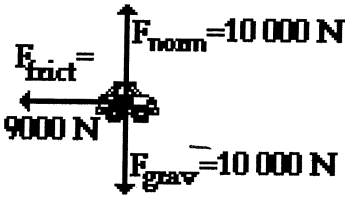
Fair + -100,000N = 10000kg · -8m/s²

c.



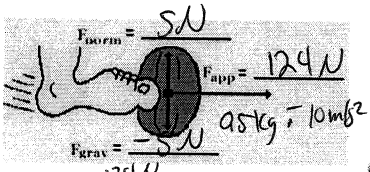
m=800 kg
a = 6.0 m/s/s, up
ΣF = 4800N up

d.



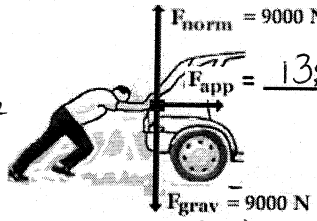
m= 1000kg
a= -9m/s²
ΣF= -9000N

e.



a = 12N / 0.5kg =
m=0.500 kg
a = 24m/s²
ΣF = 124 N, right

f.

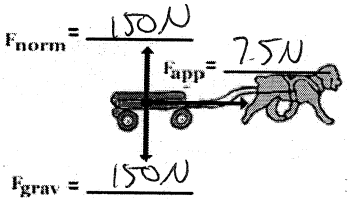


900kg · 1.5m/s²

m = -9000N / 10m/s²

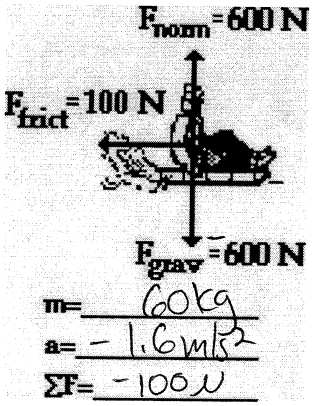
m= 900kg
a = 1.50 m/s/s, right
ΣF = 1350N

g.



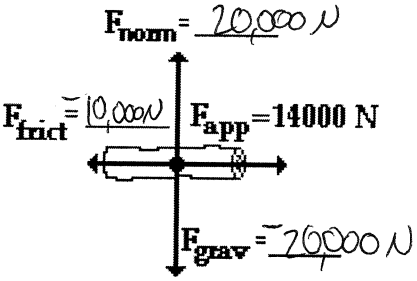
m=15.0 kg
a = 0.50 m/s/s, right
ΣF = 7.5N

h.



m= 60kg
a= -1.6m/s²
ΣF= -100N

i.



m=2000 kg
a= 2.0 m/s/s, right
ΣF= 4000N

$F_{app} + F_f = m \cdot a$
$14000N + F_f = 2000kg \cdot +2m/s^2$
$14000N + F_f = +4000kg$
$F_f = -10,000N$