

Newton's Second Law

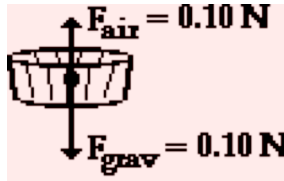
Read from Lesson 3 of the Newton's Laws chapter at The Physics Classroom:

<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 ($\Sigma F = m \cdot a$) to fill in all blanks. Use the approximation that $g = \sim 10 \text{ m/s/s}$.

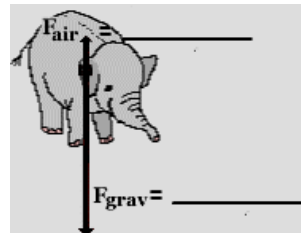
a.



$F_{\text{air}} = 0.10 \text{ N}$
 $F_{\text{grav}} = 0.10 \text{ N}$

$m =$ _____
 $a =$ _____
 $\Sigma F =$ _____

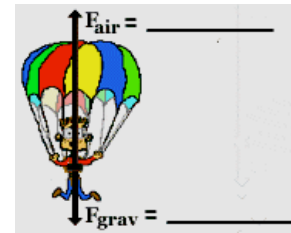
b.



$F_{\text{air}} =$ _____
 $F_{\text{grav}} =$ _____

$m = 10000 \text{ kg}$
 $a = 8.0 \text{ m/s/s, down}$
 $\Sigma F =$ _____

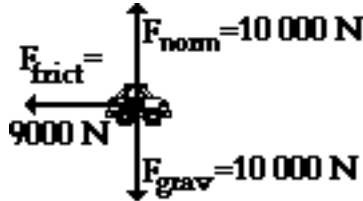
c.



$F_{\text{air}} =$ _____
 $F_{\text{grav}} =$ _____

$m = 800 \text{ kg}$
 $a = 6.0 \text{ m/s/s, up}$
 $\Sigma F =$ _____

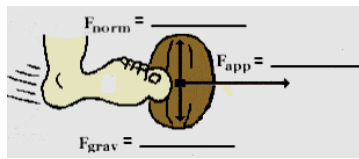
d.



$F_{\text{norm}} = 10\,000 \text{ N}$
 $F_{\text{frict}} = 9000 \text{ N}$
 $F_{\text{grav}} = 10\,000 \text{ N}$

$m =$ _____
 $a =$ _____
 $\Sigma F =$ _____

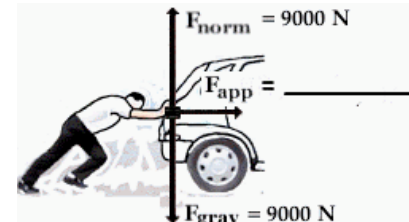
e.



$F_{\text{norm}} =$ _____
 $F_{\text{app}} =$ _____
 $F_{\text{grav}} =$ _____

$m = 0.500 \text{ kg}$
 $a =$ _____
 $\Sigma F = 124 \text{ N, right}$

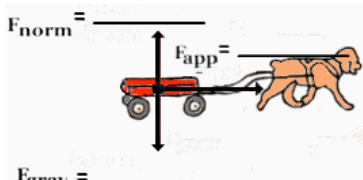
f.



$F_{\text{norm}} = 9000 \text{ N}$
 $F_{\text{app}} =$ _____
 $F_{\text{grav}} = 9000 \text{ N}$

$m =$ _____
 $a = 1.50 \text{ m/s/s, right}$
 $\Sigma F =$ _____

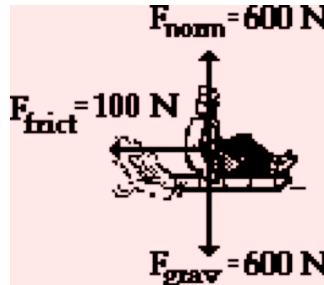
g.



$F_{\text{norm}} =$ _____
 $F_{\text{app}} =$ _____
 $F_{\text{grav}} =$ _____

$m = 15.0 \text{ kg}$
 $a = 0.50 \text{ m/s/s, right}$
 $\Sigma F =$ _____

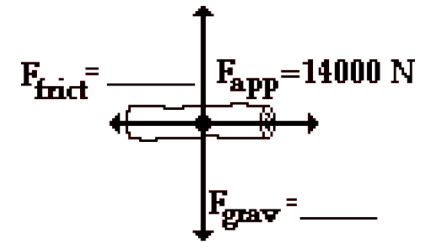
h.



$F_{\text{norm}} = 600 \text{ N}$
 $F_{\text{frict}} = 100 \text{ N}$
 $F_{\text{grav}} = 600 \text{ N}$

$m =$ _____
 $a =$ _____
 $\Sigma F =$ _____

i.



$F_{\text{norm}} =$ _____
 $F_{\text{app}} = 14000 \text{ N}$
 $F_{\text{frict}} =$ _____
 $F_{\text{grav}} =$ _____

$m = 2000 \text{ kg}$
 $a = 2.0 \text{ m/s/s, right}$
 $\Sigma F =$ _____