

Newton's Second Law Problem-Solving

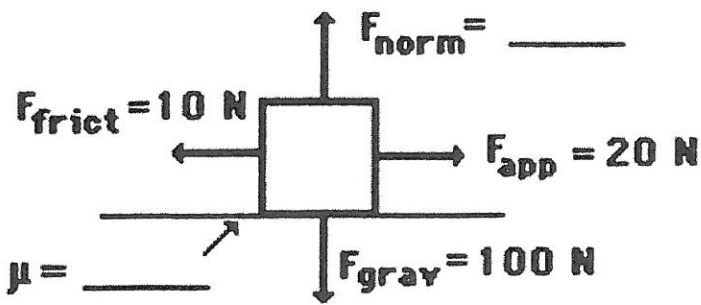
Study from **Lessons 3** of the Newton's Laws chapter at **The Physics Classroom**:

<http://www.physicsclassroom.com/Class/newtlaws/u2l3c.html>

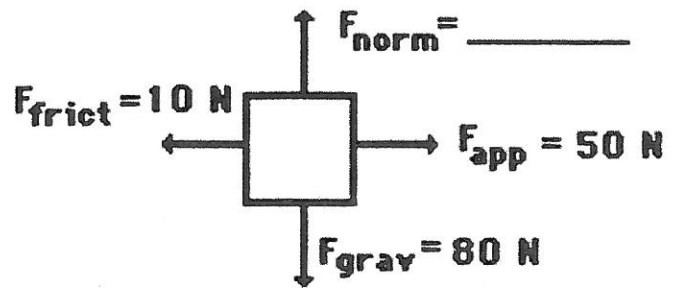
<http://www.physicsclassroom.com/Class/newtlaws/u2l3d.html>

For the following problems, construct a free-body diagram and show your work clearly.

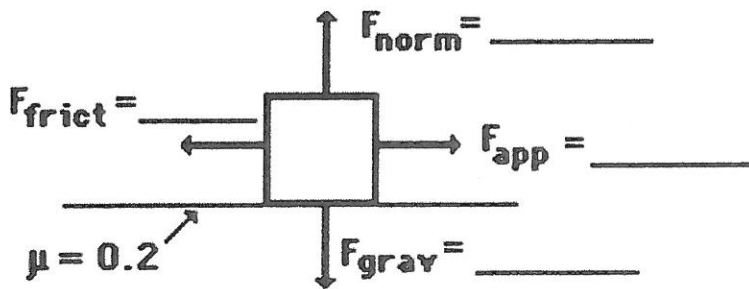
1. A rightward force of 302 N is applied to a 28.6-kg crate to accelerate it across the floor. The coefficient of friction between the crate and the floor is 0.750. Determine the acceleration of the crate.
2. During a football workout, two linemen are pushing the coach on the sled. The combined mass of the sled and the coach is 300 kg. The coefficient of friction between the sled and the grass is 0.800. The sled accelerates at a rate of 0.580 m/s/s. Determine the force applied to the sled by the lineman.
3. A 405-N rightward force is used to drag a large box across the floor with a constant velocity of 0.678 m/s. The coefficient of friction between the box and the floor is 0.795. Determine the mass of the box.
4. A 6.58×10^3 N upward tension force is exerted on a 521-kg downward-moving freight elevator. Determine the acceleration of the elevator.



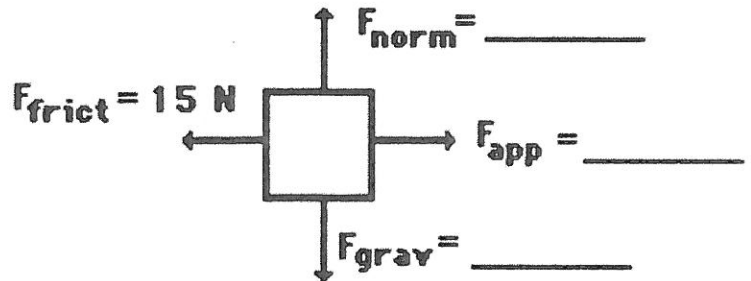
$m =$ _____
 $a =$ _____
 $F_{net} =$ _____



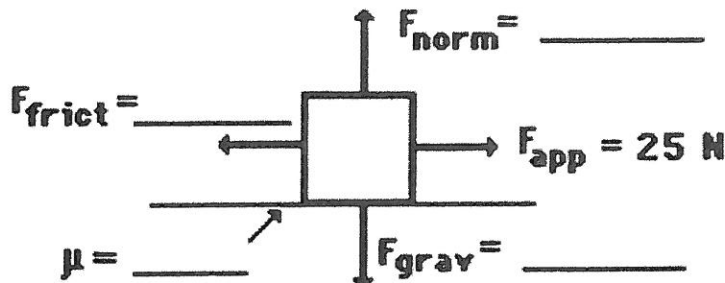
$m =$ _____
 $a =$ _____
 $F_{net} =$ _____



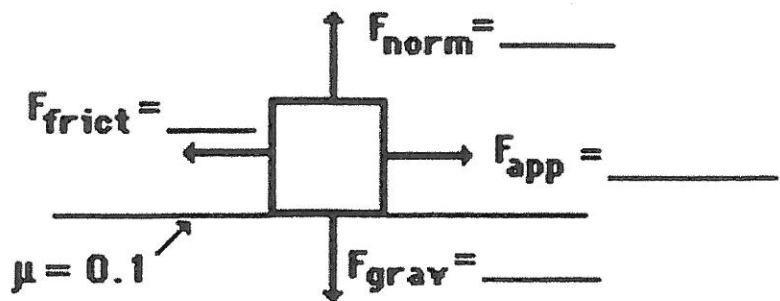
$m = 10 \text{ kg}$
 $a = 0 \text{ m/s/s}$
 $F_{net} =$ _____



$m = 6 \text{ kg}$
 $a = 0 \text{ m/s/s}$
 $F_{net} =$ _____



$m = 4 \text{ kg}$
 $a = 2.5 \text{ m/s/s, right}$
 $F_{net} =$ _____



$m = 5 \text{ kg}$
 $a = 2 \text{ m/s/s, right}$
 $F_{net} =$ _____