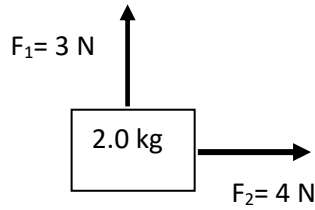


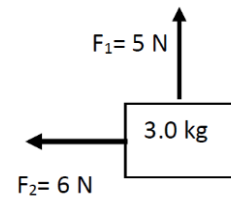
Forces in 2 dimensions and vectors  
 Honors Physics

Name \_\_\_\_\_

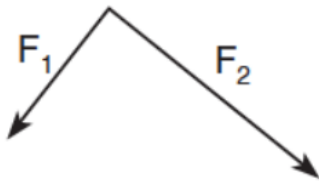
1. What is the resultant vector? magnitude and direction ( $\theta$ )



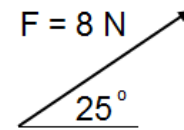
2. What is the resultant vector? magnitude and direction ( $\theta$ )



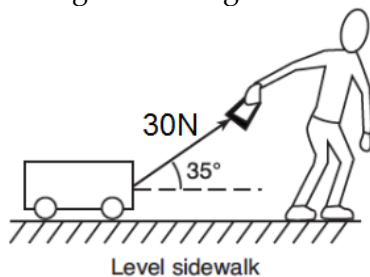
3. Two forces act on a single particle as shown in the diagram. Use a ruler and/or protractor to determine the resultant vector.



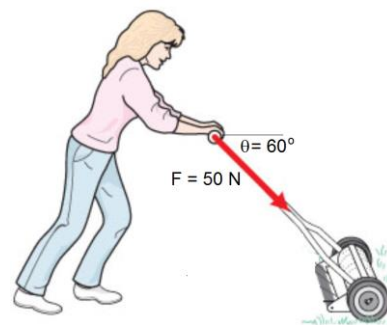
4. Determine the x and y components of the following vector.



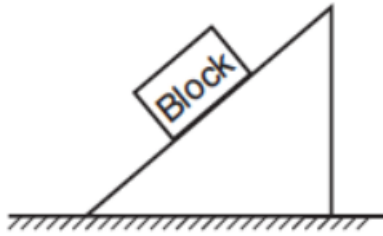
5. A child pulls a wagon as shown with a force of 30 N at an angle of  $35^\circ$  above the horizontal. The wagon is moving at a constant velocity. Determine the x and y components of the pulling force. What is the force of friction acting on the wagon?



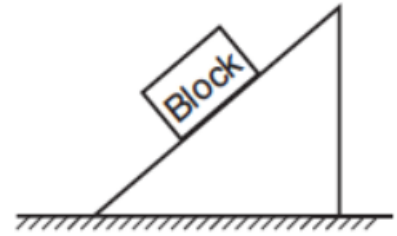
6. A woman pushes a lawn mower at a constant velocity with a force of 50 N at an angle of  $60^\circ$  below horizontal. Determine the x and y components of the pushing force. What is the force of friction acting on the mower? If the mower weighs 68 N, what is  $\mu_k$ ?



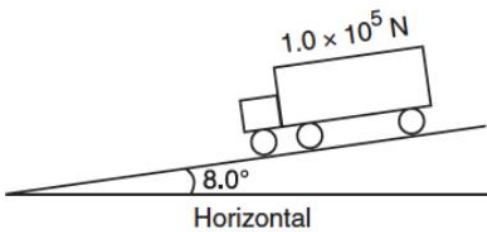
7. A block is at rest on an incline. Draw and label the 3 forces acting on the block.



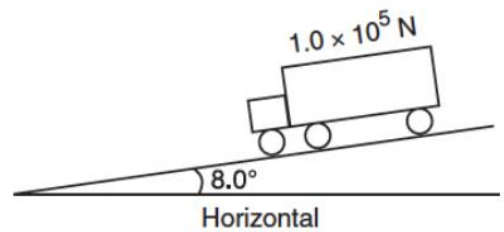
8. A block is being pulled up an incline at a constant velocity. Draw and label the 4 forces acting on the block.



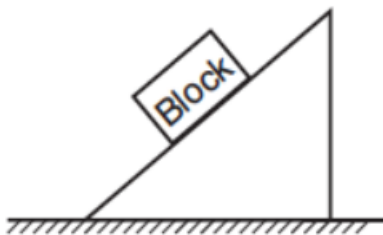
9. The diagram below shows a  $1.0 \times 10^5$  Newton truck at rest on a hill that makes an angle of  $8.0^\circ$  with the horizontal. What is the component of the truck's weight parallel to the hill?



10. The diagram below shows a  $1.0 \times 10^5$  Newton truck at rest on a hill that makes an angle of  $8.0^\circ$  with the horizontal. What is the normal force acting on the truck?

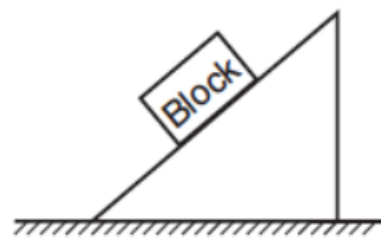


11. A 4.0 kg block is at rest on a  $20^\circ$  incline. Draw and label the 3 forces acting on the block. Determine the following values.



weight = \_\_\_\_\_  
 $F_{||}$  = \_\_\_\_\_  
 $F_{\perp}$  = \_\_\_\_\_  
 $F_N$  = \_\_\_\_\_  
 $F_f$  = \_\_\_\_\_  
 $\mu$  = \_\_\_\_\_

12. A 2.0 kg block is pulled up a  $35^\circ$  incline at a constant velocity with a force of 15 N. Draw and label the 4 forces acting on the block. Determine the following values.



weight = \_\_\_\_\_  
 $F_{||}$  = \_\_\_\_\_  
 $F_{\perp}$  = \_\_\_\_\_  
 $F_N$  = \_\_\_\_\_  
 $F_f$  = \_\_\_\_\_  
 $\mu$  = \_\_\_\_\_