

# Physics

Name \_\_\_\_\_

Date \_\_\_\_\_ Period \_\_\_\_ # \_\_\_\_\_

Ingrum 10/96

## Topic 6 Review Worksheet

1. A person walks 40.0 m east and 100.0 m south. What distance has the person traveled?

1. \_\_\_\_\_

2. What is the person's displacement in problem 1?

2. \_\_\_\_\_

3. A motorboat heads due west at 10.0 m/s. The river has a current of 6.0 m/s due south. What is the resultant velocity of the boat?

3. \_\_\_\_\_

4. If the river in problem 3 is  $2.0 \times 10^2$  m wide, how long does it take the boat to cross the river?

4. \_\_\_\_\_

5. How far downstream is the boat in problem 3 when it reaches the other side?

5. \_\_\_\_\_

6. A rope is tied around a tree. One person pulls with a force of 40.0 N north; another person pulls with a force of 60.0 N west. What is the resultant force on the tree?

6. \_\_\_\_\_

7. An airplane flying at 175 km/h on a heading of  $45^\circ$ . The wind is blowing from  $301^\circ$  at 45 km/h. What is the resultant velocity of the plane?

7. \_\_\_\_\_

8. A child is pulling on a rake handle with a force of 45 N at an angle of  $50.0^\circ$  with the horizontal. What is the horizontal and vertical components of the force?

8. \_\_\_\_\_

9. A boulder weighing  $2.0 \times 10^4$  N is resting on a hillside with a slope of  $37^\circ$ . What force tends to cause the boulder to slide down the hill?

9. \_\_\_\_\_

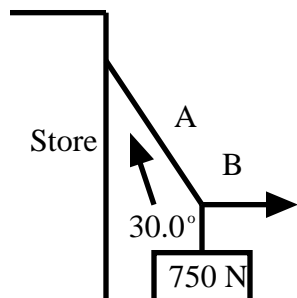
10. What force tends to push the boulder in problem 9 into the hillside?

10. \_\_\_\_\_

11. A pilot wishes to fly to a point 450 km due south in 3 hours. A wind is blowing from the west at 50 km/hr. By means of a vector diagram, compute the proper heading and speed that the pilot must choose to achieve this objective.

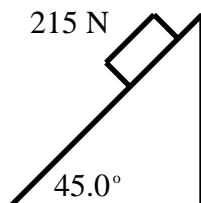
11. \_\_\_\_\_

12. A store owner wishes to hang a sign weighing 750 N so that cable A attached to the store makes a  $30.0^\circ$  angle as shown below. Cable B is attached to an adjoining building. Calculate the necessary tension in cable B.



12. \_\_\_\_\_

13. A box weighing 215 N is placed on an inclined plane that makes a  $45.0^\circ$  angle with the horizontal. Compute the component of the gravitational force acting down the inclined plane.



13. \_\_\_\_\_

14. A motorboat embarks on a trip, heading downstream in a river in which the current flows at a rate of 1.5 m/s. After 30.0 minutes, the boat has traveled a distance of 24.3 km downstream. How long will it take the boat to travel upstream to its original point of embarkation?

14. \_\_\_\_\_

15. You are a pilot on an aircraft carrier. You must fly to another aircraft carrier, now 1450 km northeast of your position, moving at 56 km/h due east. The wind is blowing from the south at 72 km/h. Calculate the heading and air speed needed to reach the carrier 2.5 h after you take off. HINT: Draw a displacement vector diagram.

15. \_\_\_\_\_