**VECTORS**

REVIEW PROBLEMS

1. A person walks 40 m east and 100 m south.

1. What distance has the person traveled?
2. What is the magnitude of the person's displacement?

2. A motorboat heads due west at 10 m/s. The river has a current of 6.0 m/s due south.

1. What is the resultant velocity of the boat? (include magnitude and direction)
2. If the river is 200 m wide, how long does it take the boat to cross the river?
3. How far downstream is the boat when it reaches the other side?

3. A rope is tied around a tree. One person pulls with a force of 40 newtons north; another person pulls with a force of 60 newtons west. What is the resultant force on the tree?

5. A child is pulling on a rake handle with a force of 45 newtons at an angle of 50 degrees with the horizontal.

1. What is the horizontal component of the force?
2. What is the vertical component of the force?

1. Find the resultant of the following two displacements: 2.0 m at 40 degrees and 4.0 m at 127 degrees.
2. Find the vector sum of the following four displacements: 60 m north; 30 m west; 40 m at 150º; 50 m at 240º.
3. A ball rolls in a straight line on a flat surface a distance of 30 meters and stops. From this position, the ball then rolls again in a straight line of 40 meters and stops.
   1. What is the maximum possible displacement of the ball from its starting position?
   2. What is the minimum possible displacement of the ball from its starting point?
   3. Could the ball be 50 meters from its starting point?