

Note: Use $g = 10 \text{ m/s}^2$ **Vector – do magnitude and angle (in degrees) from starting point**

1. You walk 7 miles south and 3 miles west. What is your displacement from your starting point?
2. A child is playing with a toy car on the floor of a train that is moving eastward. While the train travels 12.0 m/s, the child pushes the car 2.6 m/s northward on the floor of the train. What is the resulting displacement of the car?
3. Find the vector sum of 3.5 m/s east and 5.8 m/s south. Give both magnitude and direction of the sum.
4. A plane is headed directly east at 220 m/s when the wind is from the south at 15 m/s. What is the velocity with respect to the ground?
5. You are exercising by running around the deck of an ocean liner traveling west at 18.5 m/s. What is your total velocity if you are running across the ship, going south at 7.3 m/s?
6. You want to drive your motorboat directly across a stream that flows at 3.5 m/s and you know that your boat can do 4.6 m/s in still water. Find
 - (a) The angle up stream that the boat must point
 - (b) the resulting speed of the boat in the cross-stream direction.

7. In a plane that goes 310 m/s the pilot wants to fly directly north when the wind is blowing at 55 m/s from the east.

(a) In what direction must he head the plane?

(b) How fast will the plane end of going?

Component Parts

1. You are driving along at 20 m/s on a road that heads at an angle of 25° W of N.

(a) At what rate are you going N

(b) At what rate are you going W?

2. An airplane descending to the runway at 250 m/s is going at an angle of 22° with the horizontal. Find

(a) Its horizontal velocity

(b) Its rate of descent.

3. You are going 20 m/s up a hill that makes an angle of 12° with the horizontal. How fast are you going

(a) Horizontally

(b) Vertically?