

Vector Word Problems

For each problem draw and label a diagram, then solve. Be sure all steps are clearly shown for full points.

1. An airplane travels north with an airspeed of 300 mph. There is a wind from the Southwest at 50 mph. What is the resulting course of the plane? (magnitude and direction)
2. A motorboat with a speed of 9 mph in still water must aim upstream at an angle of 25.5 degrees in order to travel directly across the stream. What is the speed of the current? What is the resultant speed of the boat?
3. A swimmer can travel 2.8 mph in still water. She heads directly across a river whose current is 1.2 mph. What is the resultant magnitude and direction (be specific) of the swimmer?
4. An airplane ends up 540 miles and 20 degrees north of east from its departure point. If there was a steady wind of 30 mph from the northwest during the entire flight, then find the magnitude and direction that the plane would have gone if there had been no wind.
5. A bear travels 70 miles in a northeasterly direction from his den. It then travels 150 miles 60 degrees north of west. Determine how far and in what direction the bear is from his den.

Answers

- 1) 337.21 mph
 $\approx 84^\circ$
- 2) 3.87 mph - c
8.12 mph - b
- 3) 3.05 mph
 23.2°
downstream
- 4) 528.02 mph
 23°
- 5) 181.2 mi
 98.1°