AP Physics 1
Vector Practice Problems

1.) Bebop walks 3.0 km west, 4.0 km north, then 6.0 km east. Draw a vector diagram and find the magnitude and direction of the resultant displacement.

2.) Rat walks 12.0 km south, 8.0 km west, then 6.0 km north. Draw a vector diagram and find the magnitude and direction of the resultant displacement.

3.) Trouble walks 25 km at 30° north of east. She then walks 50 km in a direction 60° south of east. Draw a vector diagram and find the magnitude and direction of the resultant displacement.

4.) Larry flies due west at a speed of 50 m/s with a 15 m/s wind blowing from the south. Draw a vector diagram (labeling the vectors $\vec{v}_C$, $\vec{v}_w$, and $\vec{v}_A$), and determine the magnitude and direction of the vector for the actual flight.

5.) A boat heading due south crosses a wide river with a speed of 12.0 km/h relative to the water. The water in the river has uniform speed of 5.0 km/h due east relative to the Earth. Draw a vector diagram (labeling the vectors $\vec{v}_C$, $\vec{v}_w$, and $\vec{v}_A$), and determine the magnitude and direction of the velocity of the boat relative to an observer standing on either bank.

6.) Rat wants to fly south at a speed of 45 m/s and there is a 12 m/s wind blowing from the southwest towards an angle of 20°. Draw a vector diagram (labeling the vectors $\vec{v}_C$, $\vec{v}_w$, and $\vec{v}_A$), and determine the magnitude and direction of the vector that describes the course she must fly.

7.) Larry flies due north at a speed of 50 m/s with a 15 m/s wind blowing from the southeast towards an angle of 120°. Draw a vector diagram and determine the vector that describes his actual course.

8.) Trouble wants to fly west at a speed of 40 m/s and there is a 10 m/s wind blowing from the northwest towards an angle of 300°. Draw a vector diagram (labeling the vectors $\vec{v}_C$, $\vec{v}_w$, and $\vec{v}_A$), and determine the magnitude and direction of the vector that describes the course she must fly.

9.) Lily flies southeast towards an angle of 310° at a speed of 120 m/s with a 20 m/s wind blowing from the southwest towards 30°. Draw a vector diagram and determine the vector that describes her actual course.