P12

Relative Velocity – Practice

1. A swimmer has a velocity of 2.0 m/s directly across a river that is flowing at 4.0 m/s. What is the actual velocity of the simmer? Draw vectors and clearly identify angle theta.

2. A plane is flying at 100 m/s due north with a cross wind (perpendicular to plane's velocity) of 20 m/s to the west. What is the plane's actual velocity and angel from true north?

3. A sailboat is on a heading of due East at 5.0 m/s while crossing the Gulf Stream current, which is moving 4.0m/s due North. What is the sailboat's actual speed and heading?

4. A plane leaves Atlanta flying northeast at 100 m/s. Another plane leaves Atlanta flying southwest at 150 m/s. What is their velocity relative to each other?

5. A swimmer's path appears to be going directly across a river at 1.5 m/s. The current is 2.0 m/s. How fast and at what direction must she be swimming?

6. A ship is heading 30° N of E at 10 m/s. The ocean currents are flowing north at 1.0 m/s. A man walked across the ship 1.0m/s in a direction perpendicular to the ship (30° W of N). Draw all the vectors. Add vectors algebraically to determine the velocity of the man relative to the earth.