Bearing Problems

A plane flies 250km/hr due north with a crosswind of 20km/hr W. What angle must it take (relative to due north) to continue flying due north? What is the magnitude of the resultant velocity?

A captain drives a boat with a maximum speed of 30km/hr W directly across a body of water with a current downstream of 7km/hr. At what angle has the captain positioned the boat to maintain his direction due W? What is the resultant velocity of the boat?

A pitcher can throw a ball at a velocity of 125 km/h straight ahead. If he wishes the ball to travel straight when a cross-wind is blowing at 28 km/h to the left, at what angle should he throw the ball? What will the magnitude of the ball’s resultant velocity be?

A plane heads due north, but because of a wind blowing to the west, the plane flies at a resultant velocity of 620 mi/h, 3º W of N. What was the velocity of the wind?

An air hockey puck slides on a table at a velocity of 2m/s 20˚ N of W when it is struck by a player. The resultant velocity of the puck was 4m/s 10 ˚ S of W. What was the velocity caused by the player?

A cyclist heads out on a straight road due north at 17m/s. A wind headed directly south west is blowing at 10 m/s. At what angle must the cyclist position himself to continue due north? What is his final velocity?