**Vector Practice – Physics 41**

Simple Vector Conversion

Find the magnitude and direction of the following vectors:

4.47 @ 63.43° N of E 5.39 @ 21.8° W of S 7.07 @ 45° N of W

OR OR OR

4.47 @ 27.57° E of N 5.39 @ 68.2° S of W 7.07 @ 45° W of N

Find the component form of the following vectors (in form):

17˚

32

55

63˚

37˚

7

-5.59 + 4.21 -30.6 + -9.36

24.97 + -49

Using vectors , & above, solve the following:

+ +)

-36.19 + -5.15 55.33+-39.64 0.2 + 62.57

Word Problems:

* Two people push a stalled car. One pushes at a rate of 3m/s E and the other pushes at a rate of 5m/s E. What is the resultant velocity of the car?
* A plane flies at a rate of 600km/hr E into a sustained wind of 10km/hr W. What is the resultant velocity of the plane? How far will it go in 3 hrs?

* You are rowing a boat eastward across a river at 4m/s. The current pushed you downstream at a rate of 1.8m/s. If the river is 100m wide, how far downstream from where you started do you land?
* A skywriter a distance of 200km S and 100km W of central park takes flight in sustained winds of 10km S and 10km W. How fast must he fly due north to use the wind to push him directly over central park?

AP Physics 1  
2D Vector 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 *plane’s* velocity? (NOT 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 throws the ball straight when a cross-wind is blowing at 28 km/h to the left, what will the magnitude of the ball’s resultant velocity be? By what angle will the direction of the ball be off?
* 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, 22º 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 S of W. What was the velocity caused by the player?
* A cyclist heads out on a straight road with a bearing of 30˚ north of east. A wind headed directly south west is blowing at 10 m/s. What is the velocity of the cyclist? (mag and dir)