

Vectors Worksheet #2

1. What is the resultant of a pair of forces, 100N up, and 75N down?
2. What is the resultant of the previous forces if they both act downward?
3. An airplane normally flies at 200km/h in still air. What is the resultant velocity if:
 - a. It experiences a 50km/h tail wind?
 - b. It experiences a 50km/h head wind?
4. You walk 30m South and 30m East. Draw a diagram of this vector addition and compute the resultant.
5. A ship leaves its home port expecting to travel to a port 500km due South. **Before** it can move, a severe storm comes up and blows the ship 100km due East. How far is the ship from its destination? In what direction must it travel to get there?
6. A hiker leaves camp and, using a compass, walks 4km [E], 6km [S], 3km [E], 5km [N], 10km [W], 8km [N], and 3km [S]. At the end of three days, the hiker is lost. Compute how far the hiker is from camp and which direction he should take to get back to camp.
7. Diane rows a boat at 8.0m/s directly across a river that flows at 6.0m/s
 - a) What is the resultant speed of the boat?
 - b) If the stream is 240m wide, how long will it take to row across?
 - c) How far downstream will Diane be?
8. Dave rows a boat across a river at 4.0m/s. The river flows at 6.0m/s and is 260m across.
 - a. In what direction, relative to the shore, does Dave's boat go?
 - b. How long does it take Dave to cross the river?
 - c. How far downstream is Dave's landing point?
 - d. How long would it take Dave to cross the river if there were no current?
9. Kyle is flying a plane due North at 225km/h as a wind carries it due East at 55km/h. Find the magnitude and direction of the plane's resultant velocity.

10. Kym is in a boat traveling at 3.8m/s straight across a river 240m wide. The river is flowing at 1.6m/s
- What is Kym's resultant velocity?
 - How long does it take Kym to cross the river?
 - How far is Kym downstream when she reaches the other side?
11. A weather station releases a weather balloon. The balloon's buoyancy accelerates it straight up at 15m/s^2 . At the same time, a wind accelerates it horizontally at 6.5m/s^2 . What is the magnitude and direction (with reference to the horizontal) of the resultant acceleration?
12. Kyle wishes to fly to a point 450km due South in 3.00h . A wind is blowing from the West at 50km/h . Compute the proper heading and speed that Kyle must choose in order to reach his destination just in time.