Vectors
Review Sheet

1. Define the following terms:
    a. Vector

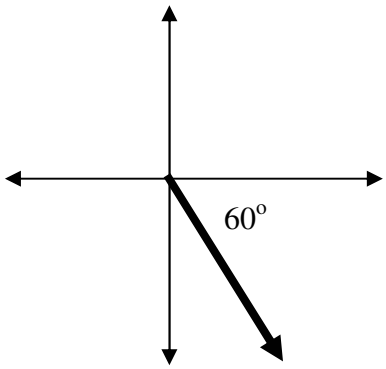
    b. Scalar

    c. Component

    d. Magnitude

    e. Direction

2. Describe the direction of the following vector in at least 4 possible ways.



3. What two things do all vectors need?

4. When vectors are acting in the same direction you _____ their magnitude and when they are acting in opposite directions you _____ their magnitudes.

    a. What is the maximum value a 5 N vector and an 8 N vector can have?

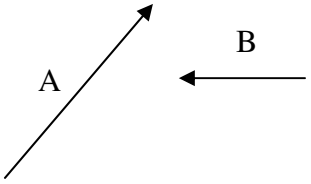
    b. What is the minimum value a 5 N vector and an 8 N vector can have?

5. A bird is flying at 7 m/s to the south when it encounters a 2 m/s gust of wind from the north. What is the bird's resultant velocity?

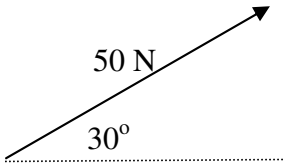
6. An ant crawls 5 cm to the north, then 5 cm to the east, then 5 cm to the south, then 5 cm to the west. Where has the ant ended up?

7. Classify each of the following as either a vector or a scalar quantity:
   a. Distance
   b. Displacement
   c. Velocity
   d. Speed
   e. Acceleration
   f. Force

8. Sketch the vectors A and B being added by the parallelogram method and the head to tail method. Be sure to show the resultant vector.



9. Find the magnitude of the horizontal and vertical components of a 50 N vector acting at 30 degrees. (Pre – AP)



10. Graphically show the resultant velocity of a bird flying at 25 m/s at and angle of 60^{o} North of East against a 5 m/s wind from the south.

11. A hike walks 12 km north and then walks 15 km west of his campsite. If the hiker walks back to the starting point in a straight line, how many kilometers will the hiker need to go?

12. A motorboat is attempting to cross a 500 m river. The motorboat heads due west at 8 m/s. The river has a current of 6 m/s due south. What is the magnitude of the resultant velocity of the boat relative to the bank? How long does it take to cross the river? How far downstream does the motorboat reach the other bank?