- 1. Give two examples of scalar quantities: *includes mass, time, distance, speed, volume, density*
- 2. Give two examples of vector quantities: <u>includes velocity, displacement, force, weight</u>
- 3. <u>Scalar</u> quantities have magnitude only. Magnitude is expressed by a <u>number</u> and a <u>unit</u>.
- 4. Vector quantities have <u>magnitude</u> and <u>direction</u>
- 5. Vectors may be represented by <u>arrows</u>, with the magnitude shown by the <u>length of the arrow</u>.
- 6. One vector having the same effect as two or more vectors combined is a <u>resultant</u> vector.
- To find the resultant of two component vectors acting in the same direction, \_\_\_\_\_\_\_.
- 8. To find the resultant of two component vectors acting in opposite directions, <u>subtract</u>.
- 9. Identify the following quantities as vector or scalar:

a.	5.0 m/s South	vector	c. 7.4 g	scalar
b.	32 n upward	vector	d. 132.4 °C	scalar

Use math to solve these problems:

1. What is the resultant of two component vectors of 78.3 units W and 15.2 units N?



2. An airplane flies southward with a velocity of 922 km/h. There is a brisk tailwind (meaning blowing on the tail of the plane) with a velocity of 25 km/h. What is the resultant velocity of the plane?

$$922 \ km/h + 25 \ km/h = 947 \ km/h$$
 South

3. Calculate the components of a resultant vector of 804 units,  $17^{\circ}$  W of S.

$$\Theta = 17^{\circ} \quad c = 804 \quad a = west = ? \quad b = south = ?$$

$$sin 17^{\circ} = \frac{west}{804} \quad west = 235 \text{ units}$$

$$cos 17^{\circ} = \frac{south}{804} \quad south = 769 \text{ units}$$

4. A person can row a boat 6.93 km/h in still water. If the person rows directly west across a river that flows north at 5.00 km/h, what is the magnitude and direction of the resultant velocity?

a 
$$a = 5.00$$
  $b = 6.93$   $c = ?$   
 $c = \sqrt{5.00^2 + 6.93^2} = 8.55$  km/h  
 $tan \Theta = \frac{5.00}{6.93}$   $\Theta = 35.8^\circ$ 
  
8.55 km/h, 35.8° N of W

Use the head-to-tail method to solve the following:

 A car travels 150 km east before turning and traveling 275 km north. What is the car's displacement?

approx. 310 km, 29° E of N





 A student walks 15 paces West then 7 paces South then 8 paces East and finally 5 paces North. What is the resultant from the start to the finish?

approx. 7 paces, 16° S of W