Name Key Hour

Notes and Examples for Vectors

*Must have protractor w/your name on it **every day** this unit.
(50 cents for a new one if you forget ☺)

A) Definitions

scalar- any quantity that has just magnitude **(** a number **)**

examples: mass, volume, density

vector- any quantity that has magnitude **and** direction

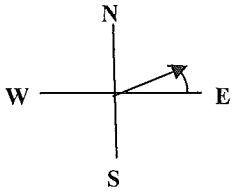
examples: velocity, acceleration

What does a vector look like? This is how we represent a vector: *tail* *head* 

The length of the vector gives its magnitude **.**

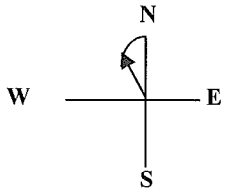
The orientation (the way it's pointing) of the vector gives its direction **.**

B) Orientation of a Vector

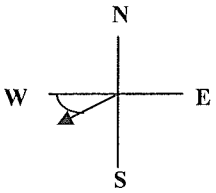


20° N of E

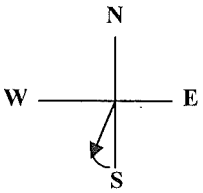
north of east axis



20° W of N



20° S of W



20° W of S

C) Adding Vectors

The sum of two or more vectors is known as the Resultant **(** $\vec{R}$ **).**

We will be learning how to add vectors 2 different ways:

1. **Method # 1: Graphically- making a** scaled drawing *(taught today.)*
2. **Method # 2: By Resolution into Components- breaking each vectors into** right **triangles and using trigonometry** *(We will learn this on* Tues. *.)* **DO NOT BE ABSENT!**

Name _____ Hour _____

Method 1: Adding Vectors Graphically
(It's making a scaled drawing.)

Steps:

1) Decide what quadrant the vectors will be in. Draw the axis and write your scale in a box.

NW	NE
SW	SE

2) Draw the first vector to scale starting at the origin and label it $\vec{A}$.

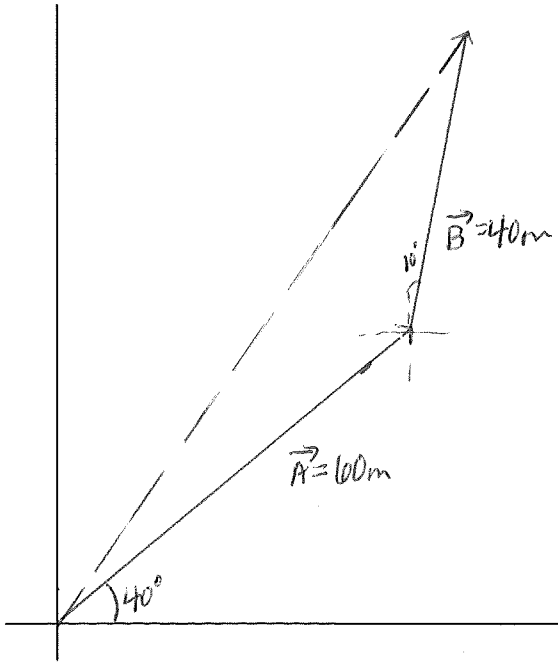
3) Draw the remaining vectors, so that they make a tail-to-head path and label them $\vec{A}$, $\vec{B}$, $\vec{C}$, etc.

4) Draw the resultant as the dashed line from the origin to the head of the last vector and label it $\vec{R}$.

5) Measure the length of $\vec{R}$ to get the magnitude and the angle of $\vec{R}$ (relative to the closest axis so angles are less than or equal to 45°) to get the direction and write your answer in a box.

Example 1: Solve the following problem graphically. (That means solve it using a scaled drawing.) **Sheldon gets upset with Leonard for taking his cereal. Sheldon chases Leonard 60 meters at 40° N of E and then 40 meters at 10° E of N. Calculate Sheldon's total displacement- which is his** distance from start.

Scale: 1cm = 10m



R = 9.5m at 35° E of N

$9.5\,\text{cm} \times \frac{10\text{m}}{1\text{cm}} = 95\text{m}$

actual = 94.2m at 34.2° E of N

$\frac{\sin B}{40} = \frac{\sin 140}{94.2}$