

## Intro to Vectors and Projectiles

Use the following site to answer the questions

<http://www.physicsclassroom.com/Class/vectors/>

\*Click on the 1<sup>st</sup> link under lesson 2 that says "What is a Projectile"

1. What is the only force acting on a projectile?

gravity

2. What are 3 examples of projectiles? (you may either draw pictures or explain)



3. a. Once projected an object continues in motion because of its Inertia.

- b. Define the term that you filled in above.

the resistance ~~an~~ an object has to a change in its state of motion

- c. What is the main factor that influences a projectile?

gravity

\*Hit the "back arrow" to return to the previous screen and then click on the link under lesson 1 that says "Vectors and Direction"

4. A vector quantity is fully described by what two things?

magnitude & direction

5. Give 3 examples of a vector.

displacement, velocity, acceleration

6. A vector diagram depicts a vector by the use of an arrow in a specific direction.

\* Scroll back to the top and click on the link that says "Vector Addition"

7. a. What is the Net Force?

sum of all individual forces acting upon an object

- b. What is another name of the net force/result?

Resultant

- c. Draw 3 examples of vector addition.

$$\vec{5} + \vec{5} = 10$$

$$\vec{5} + \overleftarrow{5} = 0$$

$$\vec{5} + \overrightarrow{10} = 15$$

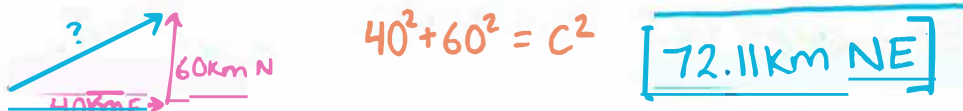
**Vector Practice Problems #2**

Key w/work

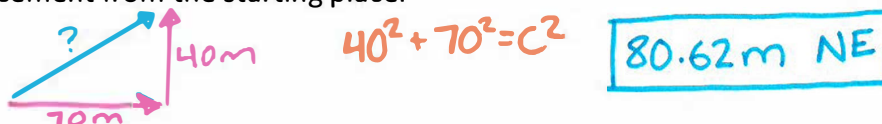
**Directions:**

1. Draw a diagram of each situation described
2. Solve for the resultant vector using trigonometry or the Pythagorean theorem to solve some of the problems, especially if they form right triangles.
3. Give the magnitude and direction as your answer and box it off

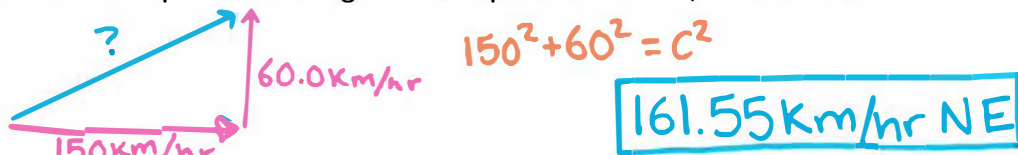
1. A Nissan Sentra travels 40 km due east and then 60 km due north. What is the magnitude and direction of the resultant displacement of the car?



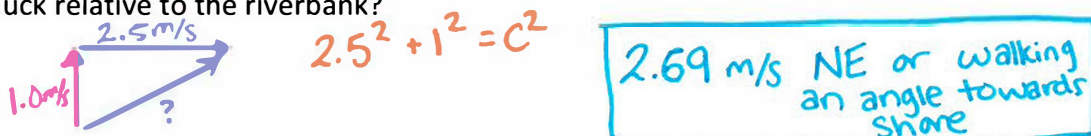
2. Val walks 70 m to an elevator, and then ascends 40 m. Find the magnitude and direction of the displacement from the starting place.



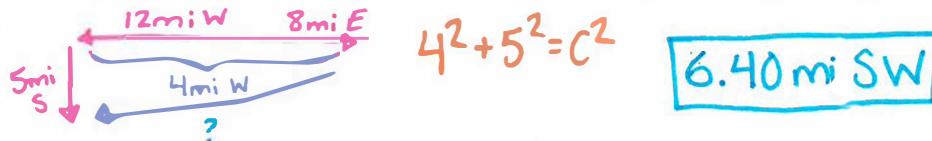
3. A 60.0 km/hr wind is blowing due north. What is the magnitude and direction of the velocity of a small Cessna airplane traveling at an air speed of 150 km/hr when it is heading east?



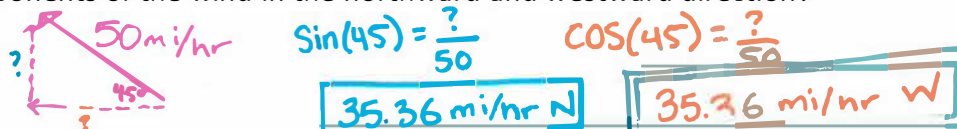
4. Huck Finn walks at a speed of 1.0 m/s across his raft (that is, he walks perpendicular to the raft's motion, relative to the shore). The raft is traveling down the Mississippi River at a speed of 2.5 m/s relative to the riverbank. What is the velocity (magnitude and direction) of Huck relative to the riverbank?



5. Zach becomes lost in the city of Rolling Meadows and travels 12 miles west, 5 miles south, and 8 miles east. Find the magnitude and direction of Zach's displacement from the starting point.



6. In Cheyenne, Wyoming, a 50 mi/hr wind is blowing 45 degrees to the northwest. What are the components of the wind in the northward and westward direction?



7. The pilot of a United Airlines 747 flight over Romania wishes to reach a point 300 km east of the starting point, the capitol, Bucharest. To avoid a terrible storm, the pilot decides to proceed to the destination in 2 hops. On the first hop, the pilot flies 60 degrees due northeast, and on the second hop, due south. How many km should be flown northeast and how many south?

