Notes: Speed and Velocity

Speed = _____

Average speed - _____

To calculate average speed:

Instantaneous speed - _____

To calculate speed at a particular moment:

Velocity = _____

Average velocity - _____

To calculate average velocity:

Instantaneous velocity - _____

To calculate velocity at a particular moment:

Differences between speed and velocity:

Are speed and velocity ever the same?

Example: A runner jogs 4 km north in 32 minutes, then 2 km south in 22 minutes, and then 1 km north in 16 minutes.

a. What is the runner's average speed for the first 32 minutes?

b. What is the runner's average speed for the entire run?

c. What is the runner's average velocity for the first 32 minutes?

d. What is the runner's average velocity for the entire run?

Notes: Vectors

Drawing Vectors

Vectors are represented by _____. The _____ of the vector is represented by the length and the _____ is represented by the tip.

Scale: 1 cm = _____

A) A person walks 40 meters south.

B) A boat travels 100 meters north.

C) A bird flies west 80 meters.

Scale: 1 cm = _____

D) A plane travels east at 250 miles/hr.

E) A plane travels west at 325 miles/hr.

F) A helicopter travels south at 75 miles/hr.

Adding Vectors

The sum of two or more vectors can be found graphically or mathematically. To find the sum graphically, connect all your scaled vectors "tip-to-tail" and measure from the start to the end. To find the sum mathematically, _____ vectors that point in the same direction, _____ vectors that point in opposite directions, and use Pythagorean Theorem for vectors that point in _____ directions.

1) A boat can travel at 12 m/s through still water. How fast can it travel on a river with a current of 2 m/s if it is traveling
   a) With the current?
   b) Against the current?

2) A bus travels 60 m north, then 120 m east. What is the displacement of the bus?

3) A girl jogs 3 miles west, then 2 miles south, then 8 miles east, then 4 miles south. Where is the girl relative to her starting position?