Motion Formulas

So far we know how to calculate average speed and average velocity using lengths and times.

Average speed and average velocity can also be calculated if we are given their initial and final values.

If you take two tests and you get a 90 on the first and a 70 on the second, what is your average?

When speed or velocity is changing at a constant rate, the average is equal to the _____ of the starting and ending values.

To find this number,

Example 1
A car starts from rest and travels in a straight line. After 6 seconds the velocity is 12 m/s east. What is the car's average velocity during that time?

How far does the car travel during the first 6 seconds?

Example 2
A bus is traveling on a highway at 26 m/s when it applies the brakes and slows down to 8 m/s over a period of 4 seconds.

How far does the bus travel while braking?

In examples 1 and 2 the velocity of the vehicle changed. In which example did it change more dramatically?

The quantity that measures the rate at which velocity changes is called _____ and is measured in units of _____.

Formula:

Calculate the acceleration of the car in example 1.

Calculate the acceleration of the bus in example 2.

A car drives slowly in a circle around a parking lot at constant speed. Is it accelerating?

What are the three ways an object can accelerate?

1. _____ (This is _____ acceleration)
2. _____ (This is _____ acceleration)
3. _____ (This is _____ acceleration)

If a car has an acceleration of 3 m/s^2 – what does this mean?