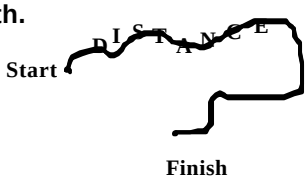
Speed and Velocity

Types of Measurements

- **Scalar**
  - **measure of quantity only**
- **Vector**
  - **measure of quantity and direction**

Distance

- **Scalar Quantity**
- **The change in position of an object along a path.**



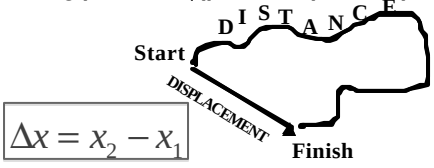
Average Speed

- **Scalar Quantity**
- **The average rate at which an object moves (rate of motion)**

$$\text{Average Speed} = \frac{\text{Total Distance}}{\text{Total Time}}$$

Displacement

- **Vector Quantity**
- **The change in position in a particular direction <u>when comparing starting and ending positions.</u> (path independent)**



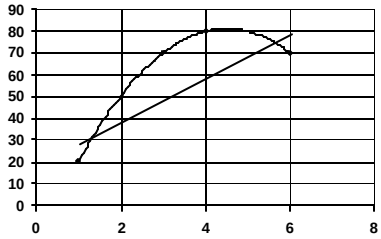
$$\Delta x = x_2 - x_1$$

Average Velocity

- **Vector Quantity**
- **Change in position or direction (displacement) over a certain time**

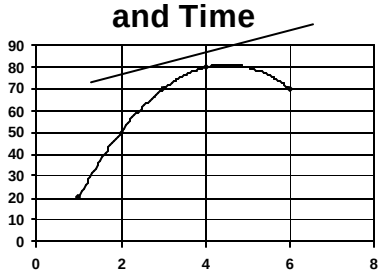
$$\bar{v} = \frac{\Delta x}{\Delta t} = \frac{x - x_0}{t - t_0}$$

Graphing Displacement and Time



- **Find average velocity using slope of the line going through those points.**

Graphing Displacement and Time



- **Find instantaneous velocity using slope of a tangent line at that point.**

The End

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