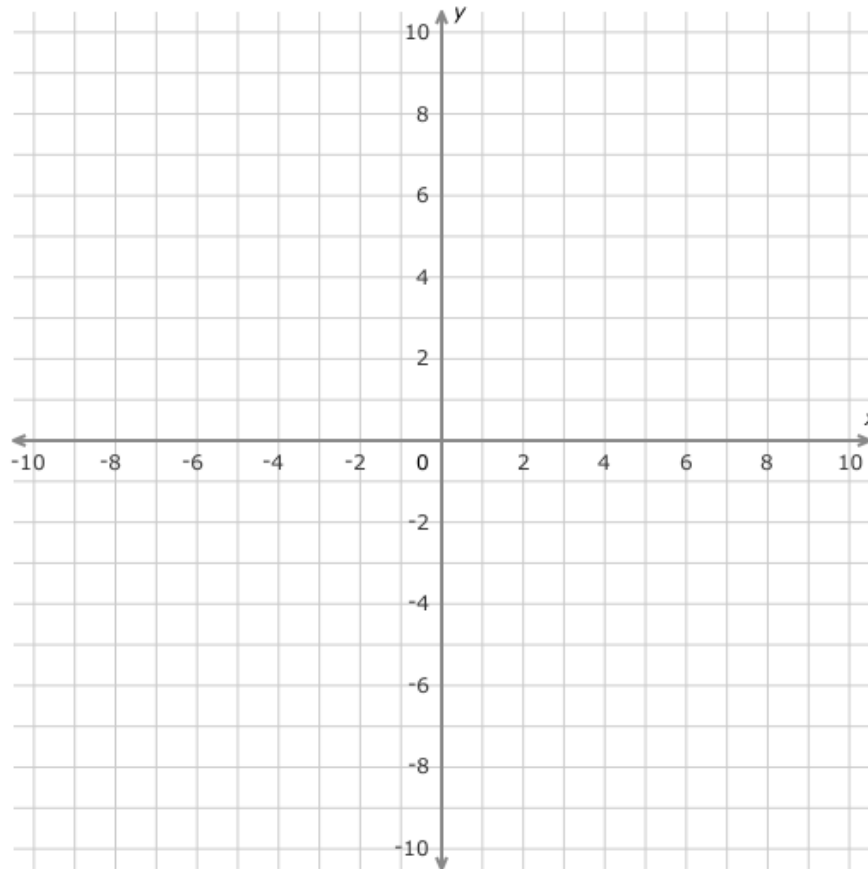


Position-Time Graphs

Displacement (d) or Position (p) on the y-axis

Time (t) on the x-axis

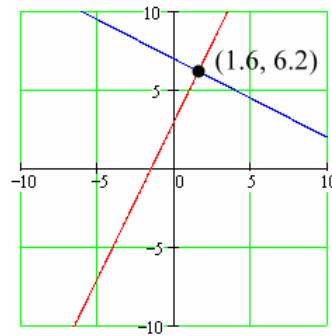


What can a Position-Time Graph tell you?

- ✓ Instantaneous Position: Position at a particular instant (an instant lasts zero seconds).

0

- ✓ Starting point: The y-intercept tells you the object's starting point. If an object starts at the measuring device, then its' y-intercept is 0. If it starts 3 meters away, then its y-intercept is 3 m.



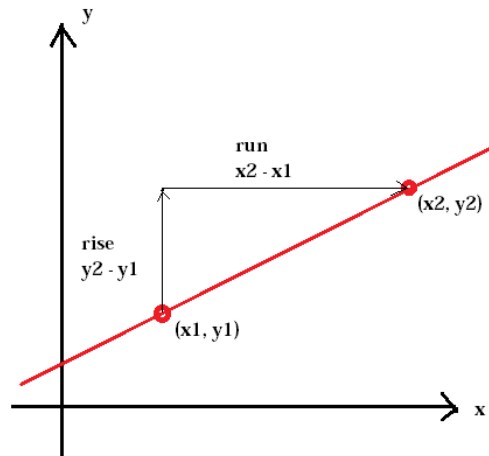
- ✓ Intersection of 2 lines tells you when 2 objects have the same position.

Position-Time Graphs

- ✓ Slope is the rate of change for the object.

How far it moves in y for every x.

Slope = rise/run = change of y / change of x



How to calculate the slope with a graph?

$$\frac{\Delta y}{\Delta x}$$

1. Pick two points on your line.
2. Subtract the y points.
3. Subtract the x points.
4. Divide the rise by the run.

Position-Time Graphs

Slope of a p-t graph = Average Velocity

$$\bar{v} = \frac{\Delta y}{\Delta x} = \frac{\Delta d}{\Delta t} = \frac{d_f - d_i}{t_f - t_i}$$

Now, let's look at units...

$$\frac{\Delta y}{\Delta x} = \frac{\Delta d}{\Delta t}$$

The SI base unit for displacement is meters.

The SI base unit for time is seconds.

Therefore, units are m/s.

In other words, slope tells how many meters the object moved in 1 second.

Position-Time Graphs

- ✓ The absolute value of the slope of a p-t graph tells you the average speed (how fast the object is moving).
- ✓ Velocity is a vector = Magnitude & Direction
Speed is a scalar = Magnitude
- ✓ Instantaneous Velocity = the speed and direction of an object at a particular instant.
- ✓ Can be found by finding the tangent to a point on a position-time graph.