Chapter 2: Motion

Section 1: Describing Motion

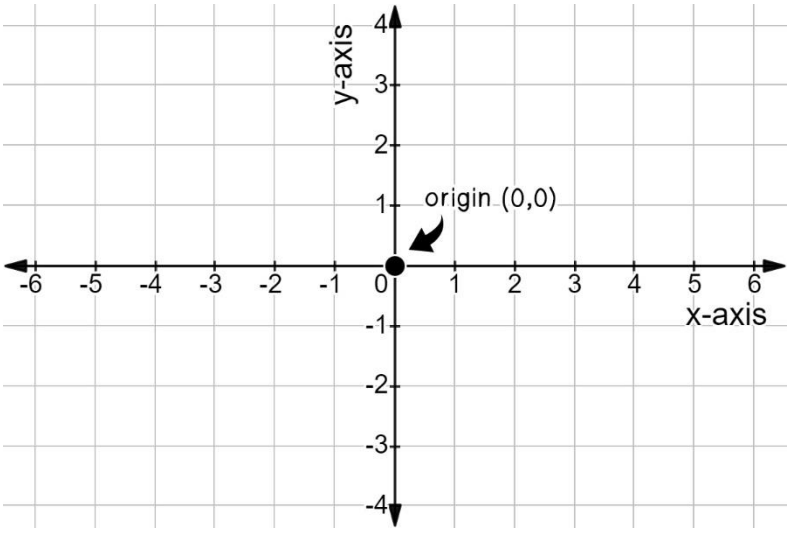
Motion: a change in an object's position relative to a reference point

An object in motion changes its position as it moves.

- A description of motion relates to place and time.

Position: the separation between an object and the origin

Coordinate System: tells you the location of the zero point of the variable you are studying and the direction in which the values of the variable increase



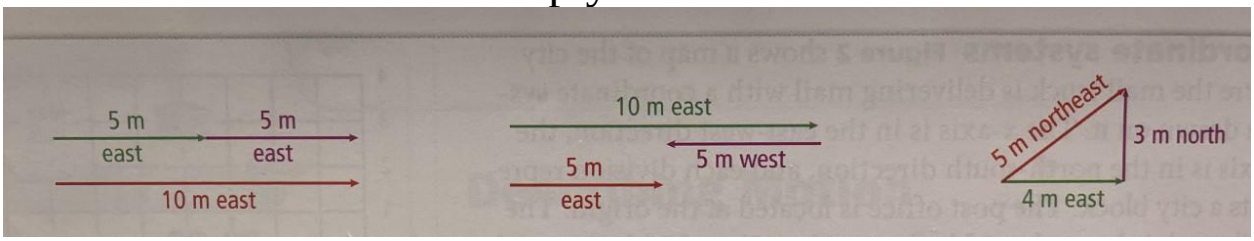
Distance: describes how far an object is from the origin

- Measured in meters (m)

Displacement: the distance and direction of the object's change in position

Adding displacement:

- Displacements in the same direction are added together
- Displacements in opposite direction are subtracted
- Displacements that are not in the same direction or opposite direction cannot be simply added or subtracted

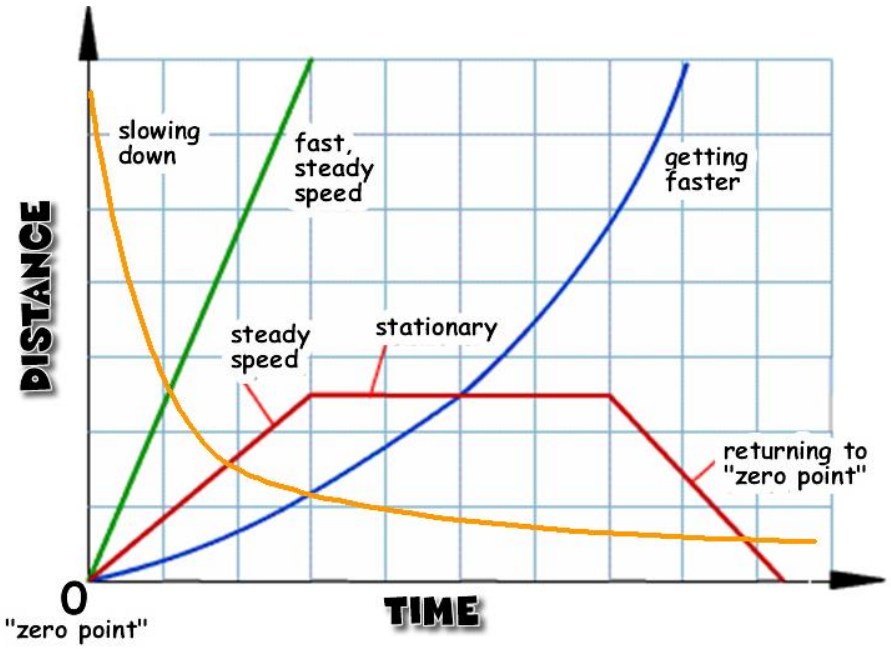


Speed: the distance an object travels per unit of time

- Speed (m/s) = $\frac{\text{distance (m)}}{\text{time (s)}}$
- Practice: A car traveling at a constant speed covers a distance of 750 m in 25 s. What is the car's speed?

Graphing Motion

- Distance is labeled on the y-axis in meters (m)
- Time is labeled on the x-axis in seconds (s)
- The slope of the line is the speed
    - Slope = rise/run = distance/time
    - Line is flat on the graph – you are not moving
    - Line is at an angle – you have speed


slowing down
fast, steady speed
getting faster
steady speed
stationary
returning to "zero point"
DISTANCE
0
"zero point"
TIME