

Ch 2

Sec 2-1

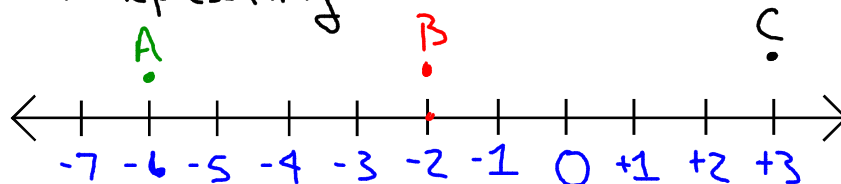
HW: RC: Sec 2.1 Writing; Con Mus Wks Sec 2.1

obj: Explain the difference between distance and displacement.

Position + Motion

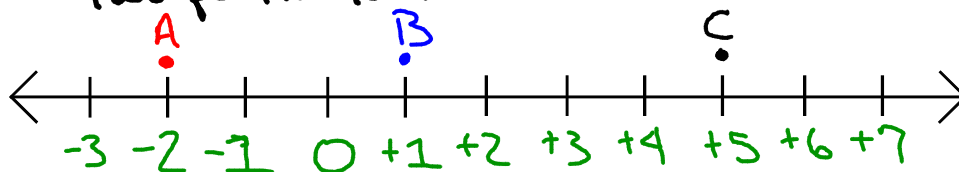
- Position is a Location w/ respect to a reference pt. (origin)
- Motion is a change in position over a period of time. (has a direction)

\* Representing Position



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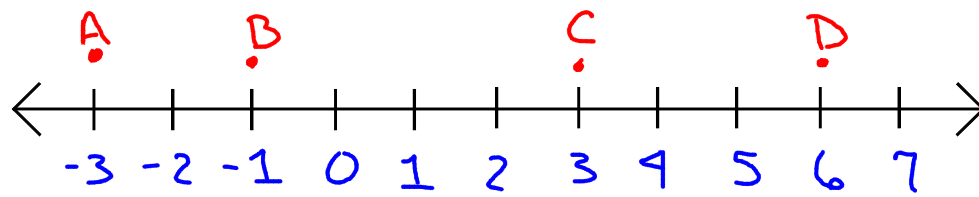
Distance - The separation btw two positions. (Distance Traveled)



Displacement - The distance w/ direction from the initial position to the final position.

\* When Dealing w/ a number line direction is either pos. or neg.

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$$\begin{aligned} \text{Total Distance} &= 22 \text{ m} & \bar{s} &= \frac{22 \text{ m}}{45 \text{ s}} = .49 \text{ m/s} \\ \text{Total Time} &= 45 \text{ s} \end{aligned}$$

Distance can never be a displacement because  
Distance does not have a direction.

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- Distance is called a scalar quantity  
\* Scalar means size.
- Displacement is called a vector quantity.  
\* Vector means size + direction.
- Position is a vector quantity.

### Speed

- A change in Position over time.  
\* Deals w/ distance traveled + time.
- 2 Types of Speed.
  - 1) Average Speed.  
\* Total Distance Traveled over total time of travel.  
$$\bar{s} = \frac{\text{Total Distance}}{\text{Total Time}}$$
  
\* Speed is a scalar quantity.
  - 2) Instantaneous Speed.  
\* Speed @ a clock reading.

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