

Motion Graphs

Position – Time Graph

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- Time (s) is the independent variable placed on the x-axis.
- Position (m) is the dependent variable placed on the y-axis.

Velocity

- Velocity is a vector.
- Velocity is Displacement divided by time interval (duration).
- Velocity is $(x(f) - x(i))/\text{time duration}$.
- Velocity always has the **SAME DIRECTION** as its Displacement.

Slope of Position - Time

- Slope of position – time is the change in position divided by the change in time.
- Slope of position – time is Velocity.
- If slope is positive, the curve goes up to the right. This means FORWARD MOTION.
- If slope is negative, the curve goes up to the left. This means BACKWARD MOTION.
- If slope is zero, the curve is flat or horizontal. This means NO MOTION = AT REST.

Average vs. Instantaneous Velocity

- Average Velocity = Change in position divided by time interval.
- Instantaneous Velocity = tangent to the curve at a specific, given moment in time.
Determine the slope of the tangent to the curve to find the instantaneous velocity.