Module 1 - Motion in 1-D

Keywords: dot motion diagram, position / velocity / acceleration vs. time.

Formulas:

$$x = x_0 + V_0 t + \frac{1}{2} a t^2$$

$x_0 = 0$ ↓ $x = V_0 t + \frac{1}{2} a t^2$

$x_0 = 0,\ V_0 = 0$ ↓ $x = \frac{1}{2} a t^2$

$a = 0$ → $x = x_0 + V_0 t$

$$V_{avg} = \frac{V_i + V_f}{2}$$

$$V_f^2 = V_i^2 + 2a\Delta x$$

Key points:

- Velocity is the slope of position vs. time graph
- Acceleration is the slope of velocity vs. time graph
- Area under velocity graph is displacement
- Area under acceleration graph is change in velocity
- Displacement ≠ distance traveled

General approach:

- Try to imagine what is happening in your mind
- Sanity check your answer

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