Kinematics Equations

How to do a word problem in physics

1) Read the problem
2) Underline important information
3) Write down your knowns and unknowns
4) Determine which equation to use
5) Rearrange the equation to solve for your variable
6) Plug in your numbers (with units)
7) Do some math
8) Write your answer with units and circle it

Velocity and Acceleration

$$\vec{v} = \frac{d\vec{x}}{dt}$$

Velocity

Change of displacement

Change in time

$$a = \frac{\Delta \mathrm{v}}{\Delta t}$$

Kinematic Equations

$$x = x_o + v_o t$$

$$v = v_o + at$$

$$x = x_o + v_o t + \tfrac{1}{2} a t^2$$

$$v^2 = v_0^2 + 2a(\Delta x)$$

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Sample Problem

A car accelerates from rest to 5 m/s^2. What is the velocity of the car after 18 seconds?

Sample Problem

A motorcyclist is moving with a velocity of 45 m/s. He slows down with an acceleration of -3.5 m/s^2. How fast is he traveling after 4 seconds?