

Physics

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Kinematic Equations for Uniform Acceleration

Use these forms of the kinematic equations for objects that are not in free-fall

$$V_f = V_i + at$$

$$\Delta x = V_i t + \frac{1}{2}at^2$$

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

$$\Delta x = \frac{1}{2}(V_i + V_f)t$$

Use these modified forms of the kinematic equations for objects in free-fall

Note: The negative sign in the equations take into account that the direction of the acceleration due to gravity, g is downward. This means that you should always enter g as a positive value and when using these forms of the equations and assume that upward is the positive reference direction of motion.

$$V_f = V_i - gt$$

$$\Delta y = V_i t - \frac{1}{2}gt^2$$

$$V_f^2 = V_i^2 - 2g\Delta y$$

$$\Delta y = \frac{1}{2}(V_i + V_f)t$$