

### Kinematic Equations 3

Objectives:

As in kinematic equations 2, use each of the kinematic equations to solve problems.

Name	Equation
Definition of Acceleration	$v_f = v_i + a \cdot \Delta t$
The King of Kinematic Equations	$\Delta x = v_i \cdot \Delta t + \frac{1}{2} a (\Delta t)^2$
The Average Velocity Formula	$\Delta x = \left( \frac{v_i + v_f}{2} \right) \Delta t$
No-Time Equation	$v_f^2 = v_i^2 + 2a \cdot \Delta x$

However, in this quiz, unlike in kinematic equations 2, problems are more real world and less clearly defined. Students must understand the problem being asked and model it in terms of kinematic quantities.

- Problems involving free-fall, in which acceleration =  $9.8 \text{ m/s}^2$ , appear frequently on this quiz.

If I drop something off the roof, how fast is it traveling after 3 seconds. (ignoring air resistance)?

A running squirrel accelerates from 3 m/s to 5 m/s in 6 seconds. How far does she travel while accelerating?

If a car accelerates from 0 to 30 m/s in a time of only 3.5 seconds, how far does it travel in that time?

If a car accelerates from 0 to 35 m/s with an acceleration of  $12 \text{ m/s}^2$ , how far does it travel in that time?

How long does it take something that has been dropped off of a 60 m roof to strike the ground?

Something falls off a roof and strikes the ground after 2.4 seconds. How tall was the roof?