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 m/s^2, appear frequently on this quiz.

Use g = 9.8 m/s^2 if you want to have 2 significant figures of accuracy. If you want 3 significant figures of accuracy, use g = 9.81 m/s^2.

1. If I drop something from rest off the roof, how fast is it traveling after 3.0 seconds. (ignoring air resistance)?

2. A running squirrel accelerates from 3.0 m/s to 5.0 m/s in 6.0 seconds. How far does she travel while accelerating?

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

4. If a car accelerates from zero to 35 m/s with an acceleration of 12 m/s^2, how far does it travel in that time?

5. How long does it take something that has been dropped from rest off of a 60.0 m roof to strike the ground?

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

Answers:
[note that all answers are written with the correct number of significant figures]

1. 29 m/s
2. 24 m
3. 35 m
4. 51 m
5. 3.50 s
6. 28 m