Name: _____ Hour: _____

Solve each application problem by solving a quadratic equation. *Round answers to the nearest tenth when necessary*. **Don't forget** units, **and write answers in SENTENCE form.**

1. An object is dropped from a 56-foot bridge over a bay. How long will it take for the object to reach the water?

2. Many birds drop shellfish onto rocks to break the shell open and get the food inside. Suppose a crow drops a snail from a height of 20 feet. How long does it take the snail to hit the ground?

3. An object is dropped from the top of a 240-foot tall observation tower. How long will it take for the object to reach the ground?

4. A stunt man working on the set of a movie is to fall out of a window 100 feet above the ground. An air cushion that is 9 feet high is placed below him for safety. How long does he fall before landing on the cushion?

5. A ball is dropped from a sixth-floor window at a height of 70 feet. There is a 2nd floor balcony below that is 24 feet above the ground. When will the ball land on the balcony?

6. An object falls from the top of a 100-foot communications tower. There is a 15-foot semi-truck beneath it. After how much time will the object hit the top of the truck?

7. On any planet, the height h (in feet) of a falling object t seconds after it is dropped can be modeled by $h = -\frac{g}{2}t^2 + h_0$ where h_0 is the initial height and g is the acceleration due to the planet's gravity. For each planet below, find the time it takes for a rock dropped from a height of 200 feet to hit the ground.

   a. Mars: g = 12

   b. Jupiter: g = 81

   c. Neptune: g = 36

8. The equation h = $0.019s^2$ gives the height h (in feet) of the largest ocean waves when the wind speed is s knots. How fast is the wind blowing if the largest waves are 15 feet high?