Free Fall Example Problems

1. The Eiffel Tower is 324 meters tall. If we make the (totally unrealistic) assumption that there is no air resistance, how fast would a penny dropped from the Eiffel Tower be travelling the moment before it hit the ground?

2. You have a kitten named Mittens. You toss Mittens into the air at an initial velocity of 8 m/s.

   (a) How high will Mittens go before coming back down (at which point, you, of course, will gently catch her.)

   (b) What is the total time that Mittens is in the air?

   (c) What is Mittens' velocity right before she is caught?

3. You stand at the top of a 30-meter cliff and shoot an arrow straight up into the air at an initial velocity of 12 m/s. You let it fall down to the bottom of the cliff

    (a) How fast will the arrow be travelling when it makes it to the bottom of the cliff?

    (b) How long will the arrow be in the air?

    (c) What is the maximum height of the arrow?

4. A stone is hurled straight upward at a speed of 30 m/s from ground level.

    (a) What is the total time of flight?

    (b) What is the speed at the top of the flight?

    (c) What is the acceleration at the top of the flight?