Algebra 1 – Applications of Solving Polynomials
Notes

Name: _____
Date: _____ Hour: ___

VERTICAL MOTION A *projectile* is an object that is propelled into the air but has no power to keep itself in the air. A thrown ball is a projectile, but an airplane is not. The height of a projectile can be described by the **vertical motion model**.

KEY CONCEPT *For Your Notebook*

Vertical Motion Model

The height h (in feet) of a projectile can be modeled by

$$h = -16t^2 + vt + s$$

where t is the time (in seconds) the object has been in the air, v is the initial vertical velocity (in feet per second), and s is the initial height (in feet).

EXAMPLE 5 **Solve a multi-step problem**

ARMADILLO A startled armadillo jumps straight into the air with an initial vertical velocity of 14 feet per second. After how many seconds does it land on the ground?

$$h = -16t^2 + vt + s$$

MOTION A cat leaps from the ground into the air with an initial vertical velocity of 11 feet per second. After how many seconds does the cat land on the ground?

SPITTLEBUG A spittlebug jumps into the air with an initial vertical velocity of 10 feet per second.

a. Write an equation that gives the height of the spittlebug as a function of the time (in seconds) since it left the ground.

b. The spittlebug reaches its maximum height after 0.3125 second. How high can it jump?