Name: Date:

Basketball Problems

Key Terms/Values:

General equation:

Acceleration due to gravity =

Initial Velocity =

Release height =

Distance from free throw line to basket: 10 feet

Distance from three point line to basket (in high school): 20 feet

1. A jump shot can be modeled by the equation -16t2 + 12t + 8

a. What is the maximum height of the ball?

b. If the shooter makes the basket 15 feet from the basket, how long was the ball

traveling before it made the basket?

2. If a free throw shot is modeled by the equation -16t2 + 24t + 6 how long is the flight of the ball from release to basket?

3. If a three point shot is modeled by the equation -16t2 + 28t + 6 how long is the flight of the ball from release to basket?

4. Robby is trying to dunk a basketball. He needs to jump 2.5 ft. in the air to dunk the ball. The height that Robby’s arm is above the ground is modeled by the equation:

height = -16t2 + 12t + 2.5

Will Robby make the dunk?

5. If a toy rocket is launched vertically upward from ground level with an initial velocity of 128 feet per second, then its height h after t seconds is given by the equation *h*(*t*) = −16*t*2 +128*t* (if air resistance is neglected).

a. How long will it take for the rocket to return to the ground?

b. After how many seconds will the rocket be 112 feet above the ground?

c. How long will it take the rocket to hit its maximum height?

d. What is the maximum height?