Name: Date:

Basketball Shots and Quadratic Equations

You will be working with a partner or a group of three for this project. This project will focus on creating and solving quadratic equations that model the flight of a basketball during both a free throw and a three-point shot.

Key Terms/Values:

General equation: -16t2 + bt + c

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

Part 1: Finding Your Data for a Free Throw

1. What is your release height when shooting a basketball: \_\_\_\_\_\_\_ ft

2. What is the time from release to making the basket: \_\_\_\_\_\_\_ sec.

Part 2: Finding Your Equation

1. Using the data you collected in Part 1 find the equation that models your

basketball free throw shot. Hint: you will need to use you (t, 10) value to solve for

your initial velocity.

2. What would your initial velocity be if you were half a foot taller?

3. What would you initial velocity be if you were one foot taller?

4. If you had an initial velocity of 24 ft/sec, what would the time be from your

release to basket?

Part 3: Finding your data for a Three - Point Shot

1. What is your release height when shooting a basketball: \_\_\_\_\_\_\_ ft

2. What is the time from release to making the basket: \_\_\_\_\_\_\_ sec.

Part 4: Finding your Equation

1. Using the data you collected in Part 3 find the equation that models your

three-point Hint: you will need to use you (t, 20) value to solve for your initial

velocity.

2. What would your initial velocity be if you were half a foot taller?

3. What would your initial velocity be if you were a foot taller?

Part 5: NBA Calculations

1. If the average release height in the NBA is 7.5 ft and the average velocity for a

free throw is 24 ft/sec what is the time from the release of the ball to the basket?

2.If the average release height in the NBA is 7.5 ft and the average velocity for a

three point shot is 32 ft/sec what is the time from the release of the ball to the

basket?

Part 6: Conclusions

1. As the height increased, how did the velocity of the shot change?

2. What are some other sports/events that could be modeled by quadratic

equations?

Yay you’re done! Now you can just practice your shot and see if any of this information helped you!