

Name _____

9-4B Lesson Master

Questions on SPUR Objectives

See pages 576–579 for objectives.

USES Objective D

1. Martina is competing in an archery competition. The arrow leaves the bow at a velocity of 29.33 feet per second at 4.75 feet above the ground.

- a. Write an equation describing the height h in feet of the arrow after t seconds.
- b. Use a graphing utility to graph the equation with a window of $0 \leq t \leq 5, 0 \leq h \leq 25$.

- c. The arrow hits the center of the target after approximately 1.8333 seconds. How far from the ground is the center of the target?
- d. What is the maximum height the arrow reaches before hitting the target?

2. Flying fish evade predators by swimming fast near the surface of the water. They break the surface of the water with a velocity of 58.67 feet per second and then glide to safety.

- a. Write the equation describing the height h in feet of the fish after t seconds.
- b. Use a graphing utility to graph the equation with a window of $0 \leq t \leq 5, -2 \leq h \leq 55$.

- c. At what times will the fish be approximately 46.67 feet in the air?
- d. What is the maximum height the fish reaches before re-entering the water?

3. At a Homecoming pep rally, Ann held a water balloon competition. The water balloon that traveled the highest determined which class won.

- a. Use the table at the right to write an equation describing the height h in feet of the water balloon after t seconds for each class.

Class	Initial Height(ft)	Velocity (ft/sec)
Freshman	3	32
Sophomore	3.5	30
Junior	4	29
Senior	4.5	30

- b. Use a graphing utility to graph the equations with a window of $0 \leq t \leq 3, -2 \leq h \leq 20$.
- c. Which class won the event? What was the height of the highest water balloon?

Name _____

9-4B

page 2

4. Lewis participates in the long-jump event on the track team. After his approach, he jumps in the air at a velocity of 8 meters per second.
- a. Write the equation describing the height h in meters of Lewis after t seconds.

- b. Use a graphing utility to graph the equation with a window of $0 \leq t \leq 5$, $-2 \leq h \leq 5$.
- c. What is the maximum height of his jump?

- d. At what time(s) is Lewis about 2 meters off the ground?

- e. How long is Lewis in the air?

5. Randy threw the shot put in a track competition at a velocity of 13.2 meters per second. The initial height of the shot put was 1.5 meters.
- a. Write the equation describing the height h in meters of the shot put after t seconds.

- b. Use a graphing utility to graph the equation with a window of $0 \leq t \leq 5$, $-2 \leq h \leq 15$.
- c. Between what times was the shot put over 8 meters in the air?

- d. What does the h -intercept represent?

6. Tayyika Haneef was part of the 2002 USA Women's World Volleyball Team. Suppose she serves the volleyball at a velocity of 25 meters per second. Her opponent returns the volleyball at a velocity of 13 meters per second at a height of 1.1 meters.
- a. Write the equation describing the height h in meters of the returned volleyball after t seconds.

- b. Use a graphing utility to graph the equation with a window of $0 \leq t \leq 3$, $-2 \leq h \leq 10$.
- c. The height of the volleyball net for a women's court is 2.238 meters. Between which times was the height of the ball greater than the height of the net?

- d. What is the value of the t -intercept and what does the t -intercept represent?
