Secondary Math 2 Honors

Name

4)

## 5.3 Comparing Functions

## Determine if the following are linear, quadratic, or exponential.

1) 
$$\{(-2, -2), (-1, 1), (0, 4), (1, 7), (2, 10)\}$$
  
2)  $y = -3(x - 2)^2 + 7$ 



- 5)  $\{(-3, -17), (-2, -4), (-1, 3), (2, -12), (5, -81)\}$
- 7) A ball is thrown in the air. It then falls and returns to the ground.

- \$ x -6 \_1 \_h
- 6) Earning a \$40,000 salary with 15% commission.
- 8) Bacteria that split in half every 30 minutes.

- 9)  $\{(0, -2), (2, 14), (3, 62), (5, 4094)\}$
- 10) A gumball machine that gives out 5 gumballs for every dime you put in.

Date Period

11) Make a table for each function for integers 0-5. Then find the average rate of change over the interval [0,4] for each function.

a. 
$$f(x) = 4x + 10$$
  
b.  $g(x) = 4^{x} + 1$   
c.  $h(x) = 4x^{2} + 4x$ 

d. Average rate of change for 
$$f(x)$$
: \_\_\_\_\_  $g(x)$ : \_\_\_\_\_  $h(x)$ : \_\_\_\_\_

- e. Compare the rates of change over [0,4]
- 12) Two seagulls dive into the ocean. The given functions represent the height of each seagull above the surface of the ocean as a function of the seagull's horizontal distance from a certain buoy. For each set of functions, determine which bird descends deeper into the ocean.

a. 
$$f(x) = 3(x-5)^2 - 9$$
 or  $g(x) = \{(-8,0), (-6,-12), (-4,0)\}$ 



$$j(x) = 2x^2 + 16x + 31$$

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13) Three students are shooting wads of paper with a rubber band, aiming for a trash can in the front of the room. The height of each student's paper wad in feet is given as a function of the time in seconds. Which student's paper wad flies the highest?

Alejandro:  $y = -x^2 + 2x + 7$ Melissa:  $g = -(x - 3)^2 + 7$ Connor: After 3 seconds his wad achieves a maximum height of 6.5 feet

14) Suppose that you have been offered a position at a prestigious company. You may choose how your salary is paid. Option 1 is described by the quadratic equation  $S = 2500x^2 + 2500x + 60000$  where x is the number of years you are with the company and S is the yearly salaray in dollars. Option 2 has a starting yearly salary of \$35000, but you will get a 25% raise each year.

a. If you plan to work for this company for 5 years, which option should you choose? Why?

- b. If you plan to work for this company for 30 years, which option should you choose? Why?
- 15) Two neighboring schools use different models for anticipated growth in enrollment. School A has 850 students and predicts an increase of 100 students per year. School B also has 850 students, but predicts an increase of 8% per year. Compare the models.

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