Blizzard Bag Assignment #1: Functions

Name_____ **Date**_____

Show your work and/or explain your reasoning. You have two weeks to complete the assignment and it will be graded.

1. Determine if the following functions are increasing or decreasing, and compare their rates of change.

I	II
$y = -2x - 3$	a line which passes through the points (0, 0) and (3, -6)

- A. Both functions are decreasing and have the same rate of change.
- B. Both functions are increasing and have the same rate of change.
- C. Both functions are increasing and have different rates of change.
- D. Both functions are decreasing and have different rates of change.

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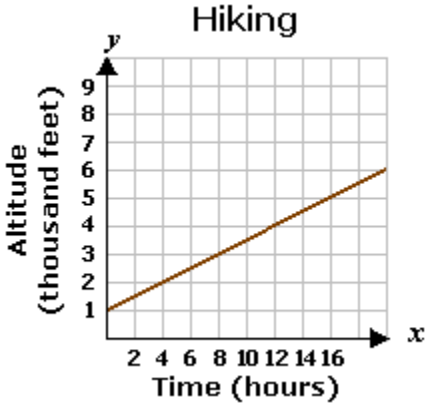
2. Edmond is on the third day of his hike up Glacier Peak. The graph below shows his hiking time and altitude for that day only.



What was his altitude at the beginning of the third day?

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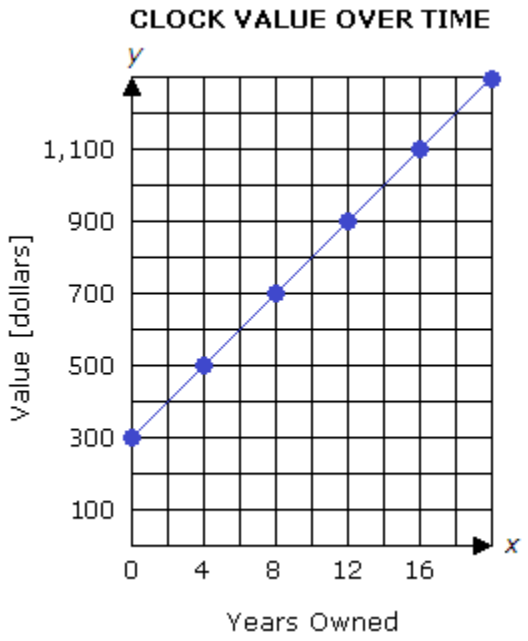
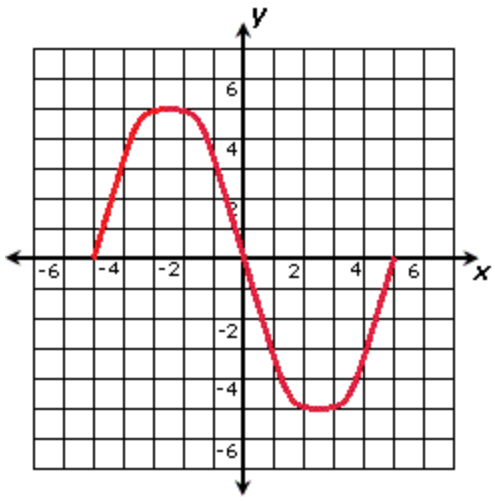
3. Several years ago, Dave bought an antique clock. Since then, it has increased in value. If *x* represents the number of years he has owned the clock, and *y* represents the value of the clock (in dollars), which of the following situations is represented by the graph below?



- A. Dave bought the clock for $300. Each year the value of the clock increased by $50.
- B. Dave bought the clock for $300. Each year the value of the clock increased by $125.
- C. Dave bought the clock for $300. Each year the value of the clock increased by $100.
- D. Dave bought the clock for $300. Each year the value of the clock increased by $200.



4. Which of the following best describes the graph above?

- A. both a relation and a function
- B. relation only
- C. neither a relation nor a function
- D. function only

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5. Which of the following best describes the equation below? Explain.

$$y = 4x^2 + 6$$

- A. nonlinear
- B. both linear and nonlinear
- C. linear
- D. neither linear nor nonlinear

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6. Which of the following best describes the equation below?Explain.

$$y = 6x^2 - 10$$

- A. linear
- B. neither linear nor nonlinear
- C. both linear and nonlinear
- D. nonlinear

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7. Stephanie planted a home garden. She planted 2 rows of tomatoes with 5 tomato plants in each row. She also planted squash in rows of 7 plants each.

If x represents the number of rows of squash she planted, which of the following equations can be used to find the total number of plants Stephanie planted in her home garden?

- A. $y = 7x + 10$
- B. $y = 7x + 7$
- C. $y = 7x + 6$
- D. $y = 12x + 6$

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8. Which of the following best describes the equation below? Explain.

$$y = -8x + 14$$

- A. linear
- B. both linear and nonlinear
- C. neither linear nor nonlinear
- D. nonlinear

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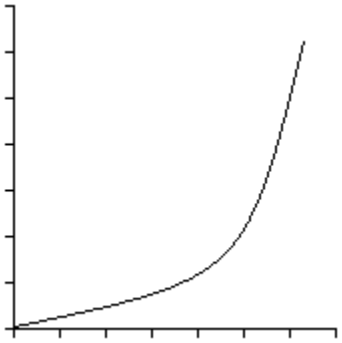
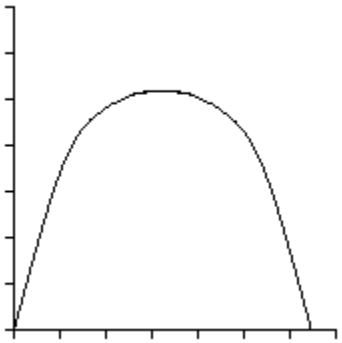
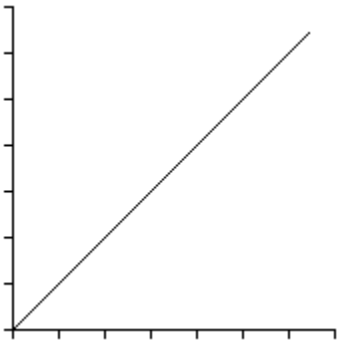
9. During the wiffleball game Tonya hit a pop fly that was caught by the center fielder. Which of the following graphs could represent the ball's path?



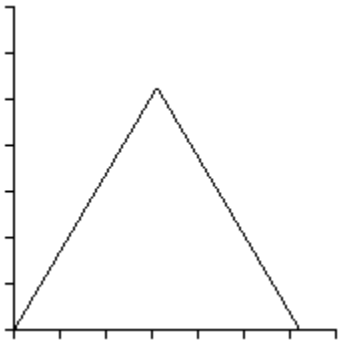
W.



X.



Y.



Z.

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10. A study was done to investigate the relationship between outdoor temperature and the amount of fluids an outdoor athlete drinks per day. The correlating linear model is shown below, where x represents the number of degrees over 80°F, and y represents the amount of fluids drank (in liters). Interpret the y-intercept.

$$y = 3.85 + 0.55x$$

- A. An athlete drinks 0.55 L per day when the temperature is 80°F.
- B. An athlete drinks 3.85 L per day when the temperature is 80°F.
- C. An athlete drinks 7 L per day when the temperature is 80°F.
- D. An athlete drinks 4.4 L per day when the temperature is 80°F.

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11. Paula has a large ball of yarn that she is going to use to knit a scarf for the winter. Every square inch on the scarf requires a certain number of yards of yarn from the ball.

A linear model of this situation contains the values (20, 233) and

(30, 114.5), where x represents the number of square inches knitted on the scarf, and y represents the number of yards remaining on the ball of yarn.

How many yards of yarn did Paula start with?

- A. 520
- B. 11.85
- C. 347.5
- D. 470

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12. Which of the following best describes the equation below? Explain.

$$y = -9x + 7$$

- A. function only
- B. neither a relation nor a function
- C. both a relation and a function
- D. relation only

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13. At the beginning of the summer, Jenna had saved $241. To earn money over the summer, she is working part time at the local community center. She will earn $21 per day of work. If x represents the number of days she works, write an equation that represents how much money she will have, including her savings?

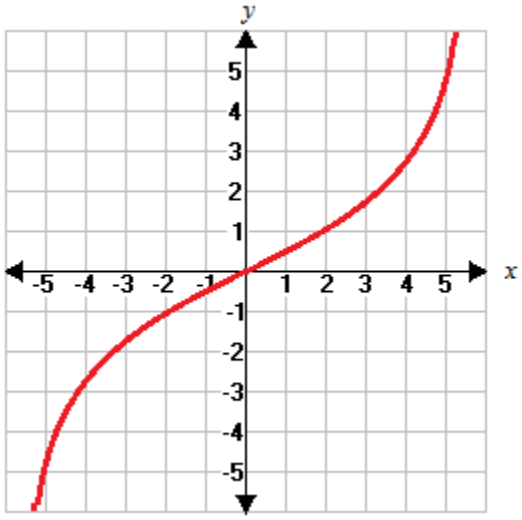
14. A company is testing a product which is intended to make hair grow faster. One of the test subjects started with a hair length of 8.2 inches. After a year of using the product, the test subject's hair measured 18.4 inches.

If the growth rate was constant during the trial period, which of the following statements applies?

- A. An additional month of product use is associated with an additional 0.85 inch of growth.
- B. An additional 2.22 months of product use is associated with an additional inch of growth.
- C. An additional month of product use is associated with an additional 2.22 inches of growth.
- D. An additional 0.85 month of product use is associated with an additional inch of growth.

Linear vs. Nonlinear

15.



The graph above represents what type of function? Linear or Nonlinear, explain.

16. The population of a certain species of oak tree in a national forest declines each year by one-fourth. So, after each year, only three-fourths of the trees present at the beginning of the year remain.

Which of the following describes the rate of decline in the population of the species of oak tree?

- A. linear
- B. neither linear nor nonlinear
- C. both linear and nonlinear
- D. nonlinear

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17. Which of the following relations is not a function? Explain.

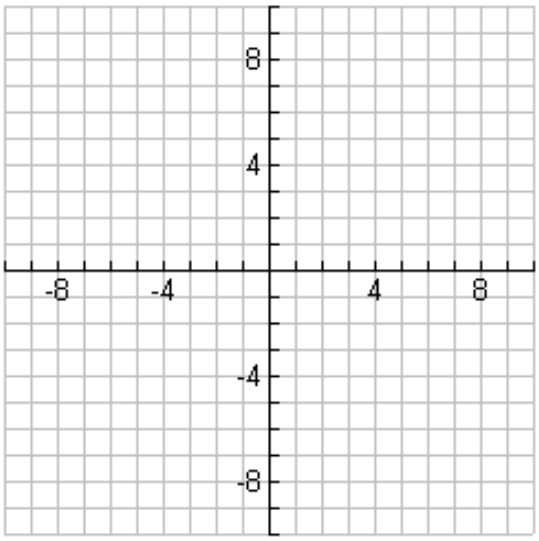
- A. (1, 4), (-4, 2), (1, 1), (-8, 2)
- B. (-8, 4), (1, 3), (-4, 1), (7, 2)
- C. (-4, 4), (1, 2), (7, 1), (-8, 5)
- D. (7, 4), (-4, 2), (1, 1), (-8, 2)

18.

x	*y*
0	-6
1	-4
2	-2
3	0

The table above represents what type of function? Linear or nonlinear, explain. Write an equation that represents the table of values.

19. Graph the equation $y = 2x + 3$ on a coordinate plane. Then give one coordinate that satisfies the equation.



20. Compare the *y*-intercepts and rates of change of the following items.

$$y = 1.5x + 3.5$$

I

x	*y*
-2	1.5
-1	2.5
0	3.5
1	4.5
2	5.5

II

- A. The items have the same *y*-intercepts and the same rate of change.
- B. The items have different *y*-intercepts and different rates of change.
- C. The rates of change are the same, but the *y*-intercepts are different.
- D. The *y*-intercepts are the same, but the rates of change are different.