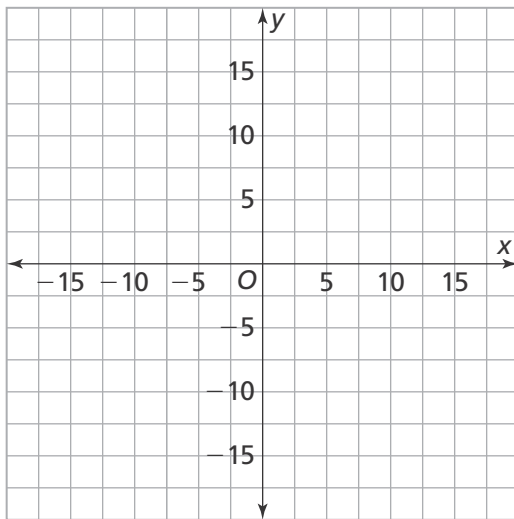


Name _____

1. How many solutions does the equation have?

$$3\left(\frac{7}{3}x + \frac{4}{3}\right) - 2x + 8 = 5x + 12$$

2. Graph the equation $y = -2x + 10$.



3. The average grain of salt is 0.0003 meters wide. *Rhinovirus*, which causes the common cold, is 0.00000003 meters wide. How many times wider is a grain of salt than *Rhinovirus*? Write your answer as a single digit times a power of 10.

- (A) 1×10^2 times
- (B) 1×10^3 times
- (C) 1×10^4 times
- (D) 1×10^5 times

4. An engineer is designing a roller coaster. The tallest peak is 310 feet high. The roller coaster travels 155 horizontal feet as it descends the hill. What is the slope of the hill?

- (A) -2
- (B) -1.55
- (C) 1.55
- (D) 2

5. Classify each number as rational or irrational.

$$\frac{1}{3}, 0.325, 0.4562345\dots, \sqrt{50}, -\frac{14}{2}$$

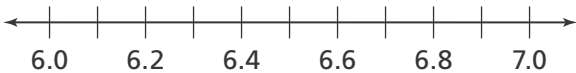
| Rational | Irrational |
|----------|------------|
| | |

6. Which of the following numbers is written in scientific notation?

- (A) 17
- (B) 17×10^6
- (C) 3.734×10^{-14}
- (D) 3.734

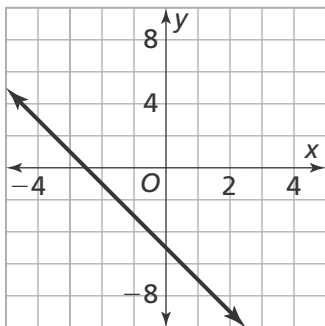
7. Compare and order the numbers below by plotting them on the number line.

$$6.8, 6.\bar{6}, \frac{46}{7}, \text{ and } \sqrt{47}$$



8. Abel says $(6^2)^3 = 6^5$. Is he correct? Explain.

9. What is the y-intercept of the graph?



- (A) -5
- (B) -2.5
- (C) 2.5
- (D) 5

10. Liam and Evan are mixing paint. Liam uses 2 quarts of yellow paint and adds $3\frac{1}{4}$ jars of blue paint. Evan uses $\frac{1}{2}$ quart of yellow paint and adds $5\frac{1}{2}$ jars of red paint. They end up with the same volume of paint.

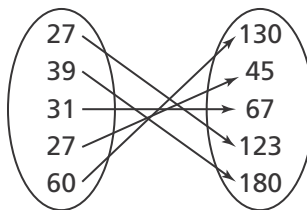
Part A

Write an equation to represent the situation.

Part B

What volume of paint did each boy mix?

11. Is the relation shown in the arrow diagram a function? Explain.



12. Jason surveyed 90 people on their preference of fruits or vegetables. Complete the two-way frequency table.

| Type of Food | Age | | |
|--------------|-------|-------------|-------|
| | Child | Adult (18+) | Total |
| Fruit | 26 | | |
| Vegetable | | 24 | 38 |
| Total | | | 90 |

13. Use the table in Exercise 12. Which statement is true? Select all that apply.

- More children than adults were surveyed.
- The same number of adults and children prefer fruit.
- More people prefer vegetables.
- More people prefer fruit.
- More adults than children prefer vegetables.

14. Complete the two-way relative frequency table using the information from Exercise 12.

| Type of Food | Age | | |
|--------------|-------|-------------|-------|
| | Child | Adult (18+) | Total |
| Fruit | | 28.9% | 57.8% |
| Vegetable | 15.5% | | |
| Total | 44.4% | 55.6% | |

15. Students at a community college were asked a survey question. The two-way frequency table shows the responses from full-time students and part-time students.

Two-Way Frequency Table

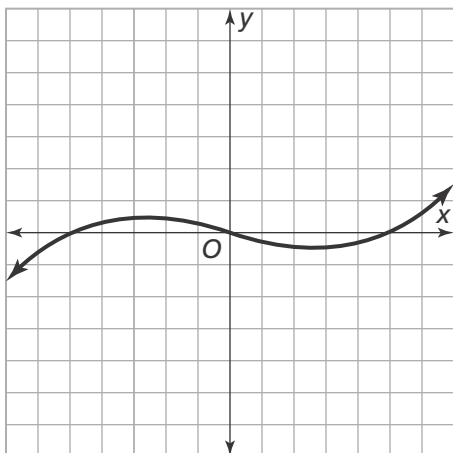
| | Yes | No | Total |
|-----------|-----|-----|-------|
| Full-time | 67 | 33 | 100 |
| Part-time | 27 | 73 | 100 |
| Total | 94 | 106 | 200 |

Is there evidence that responding yes was related to attending the college full-time or part-time? Explain.

16. The state fair charges \$14 for admission. Each ride costs \$6. What is the function that relates the amount spent, S , to the number of rides, r ?

- (A) $S = 6r - 14$
- (B) $S = 14r - 6$
- (C) $S = 6r + 14$
- (D) $S = 14r + 6$

17. Does the graph represent a function? Explain.



18. The data in the table below represent a linear relationship. Fill in the missing data.

| | | | | | |
|----------|---|------|----|------|----|
| x | 0 | 10 | 20 | | 40 |
| y | 5 | 12.5 | | 27.5 | |

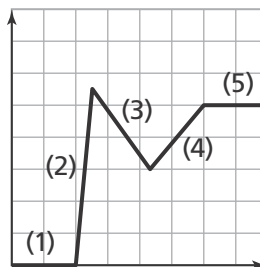
19. Write a function in the form $y = mx + b$ for the line that contains the points $(-6.4, -2.6)$ and $(5.2, 9)$.

20. Kylie recorded the number of squats she could do on each day of her training.

| | | | | |
|-------------------------|----|----|----|----|
| Day | 1 | 2 | 3 | 4 |
| Number of Squats | 10 | 12 | 15 | 19 |

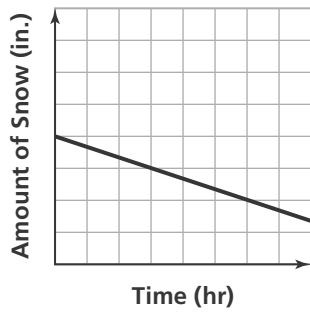
Is the relation a function? Explain.

21. In which interval is the function increasing? Select all that apply.



- Interval 1
- Interval 2
- Interval 3
- Interval 4
- Interval 5

22. The graph shows the amount of snow on the ground on one day. Describe the behavior of the function.



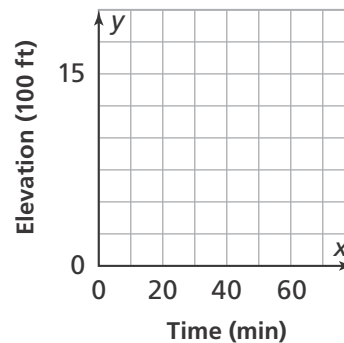
23. Madeline studies math between 1 and 8 hours per week. She wants to determine if there is a relationship between time spent studying and her exam scores. She decides to construct a scatter plot to show the data. What scales could Madeline use for the x - and y -axes?

24. The equation $y = 3x - 6$ and the table shown below describe two different linear functions.

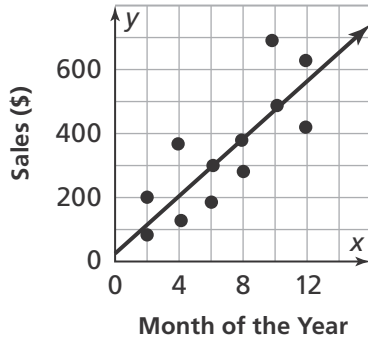
| x | y |
|-----|------|
| 1 | 5.5 |
| 2 | 9 |
| 3 | 12.5 |
| 4 | 16 |

Which function has the greatest rate of change? Explain.

25. Wylie climbs steadily down a trail that is 1,500 feet above sea level for 40 minutes. Then he takes a 10-minute lunch break. After lunch, Wylie climbs back up the trail for 5 minutes to take a picture. Finally, he hikes for 15 minutes until he reaches sea level. Sketch a graph that represents this description.



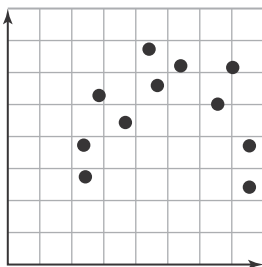
26. Which best describes the linear association shown in the scatter plot?



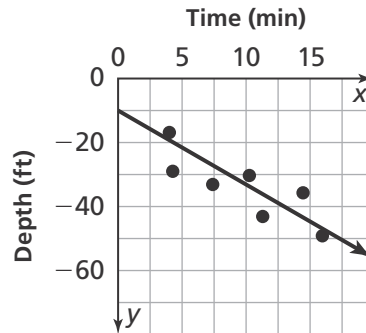
- (A) Strong positive
- (B) Weak positive
- (C) Strong negative
- (D) Weak negative

27. An equation of a trend line for the scatter plot in Question 26 above is $y = 42x + 50$. Predict how many more sales the store makes in December than in November.

28. Describe the association between the two sets of data in the scatter plot.



29. The scatter plot shows a scuba diver's depth in the ocean. The equation of the trend line shown is $y = -3.29x - 10$. Predict what the diver's depth will be after 30 minutes.



30. The scatter plot below shows the number of online posts Evie makes per day and the time at which she makes them. Identify any clusters in the scatter plot.

