

12 GEORGIA

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Common Core Coach
Mathematics **8**
Assessments

Domain
Reviews



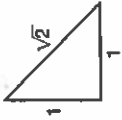
First Edition | Coach

Domain Assessment • The Number System

- What is the decimal expansion of $\frac{1}{8}$?
 - 0.1
 - 0.125
 - 0.25
 - $0.\overline{3}$
- Which of the following is true about the decimal expansion of $\frac{1}{11}$?
 - ends in 625
 - 3 repeating
 - 09 repeating
 - 27 repeating
- Convert the following repeating decimal into a fraction: $0.\overline{111111}$...
 - $\frac{1}{5}$
 - $\frac{1}{7}$
 - $\frac{1}{8}$
 - $\frac{1}{9}$
- Which decimal below is the best approximation of the irrational number π ?
 - 1.41
 - 1.62
 - 2.72
 - 3.14
- Which of the following sets contains only irrational numbers?
 - $\pi, \sqrt{2}, 4, 238905$...
 - $\frac{1}{7}, 3, 14, 5$
 - $2\frac{1}{4}, \sqrt{5}, 7, 717$
 - $0.\overline{1}, 0.\overline{09}, 0.\overline{16}$

Go On ▶

- The figure below is a right triangle.



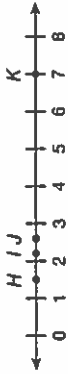
Which is the best approximation of the hypotenuse of the triangle?

- 1.21
- 1.41
- 1.73
- 2.24

- Between which two whole numbers is $\sqrt{11}$?

- 1 and 2
- 2 and 3
- 3 and 4
- 4 and 5

- Points H, I, J, and K are plotted on the number line below.



Which point on the number line represents $\sqrt{7}$?

- H
- I
- J
- K

- Which of the following fractions does not end with a decimal expansion of zeros?

- $\frac{1}{3}$
- $\frac{1}{4}$
- $\frac{1}{5}$
- $\frac{1}{8}$

10. A flagpole measures $25\frac{1}{11}$ feet tall. Which repeating decimal represents this height?

- A. 25.083 feet
- B. 25.09 feet
- C. 25.1 feet
- D. 25.16 feet

11. Which is the best approximation of $\frac{\pi+9}{3}$?

- A. 1.27
- B. 2.09
- C. 3.14
- D. 4.05

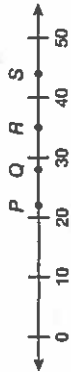
12. Which of the following sets contains only rational numbers?

- A. $0.\bar{3}$, $0.\overline{16}$, 3.14
- B. $\frac{1}{9}$, π , $4\frac{1}{6}$
- C. $0.\bar{2}$, $\frac{3}{2}$, $\sqrt{7}$
- D. $0.\bar{8}$, $0.\overline{87}$, $0.16075423\dots$

13. In an art class, Jorge constructs a 2 feet by 4 feet frame for a painting he just finished. He uses the Pythagorean theorem to find the diagonal of the frame, which is $\sqrt{20}$ feet. He then concludes that the diagonal must be at least 5 feet. Is he correct in his conclusion?

- A. Yes, because $2 + 4 \leq 6$.
- B. Yes, because $\sqrt{20} \approx 5.48$.
- C. No, because $4^2 = 16$ and $5^2 = 25$, so $\sqrt{20}$ must be between 4 and 5.
- D. No, because $\sqrt{20} = 2^2 + 3^2$, so $\sqrt{20}$ must be between 2 and 3.

14. The formula for the circumference of a circle is πd , where d is the diameter. Kim measures the diameter of each of four pools in his neighborhood and uses this formula to find their circumferences, in feet. They are plotted on the number line below.



Which point best represents the pool with a diameter of 14 feet?

- A. P
- B. Q
- C. R
- D. S

15. Which irrational number below is approximately equal to 2?

- A. $\sqrt{3}$
- B. $\sqrt{5}$
- C. $\sqrt{7}$
- D. $\sqrt{8}$

16. This baseball season, Barry gets two hits for every 16 at bats. This statement represents his batting average.

A. Write his batting average as a fraction and as a decimal.

B. Does Barry's batting average in decimal form end in zeros?

17. Scott cuts his birthday cake into nine equal pieces and eats two of them.

A. Use long division to compute in decimal form how much of the cake he ate. (Ensure your answer includes the first four digits of the decimal.)

B. Does the decimal appear to repeat indefinitely or end in zeros?

Go On ▶

18. A middle school with 375 students has 125 students in the eighth grade. Irene says that the eighth-grade class makes up $0.\overline{1}$ of the school. Yolanda says that the eighth-grade class makes up $0.\overline{3}$ of the school. Fernando says that the eighth-grade class makes up $0.\overline{6}$ of the school.

A. Convert each student's decimal into a fraction.

Irene: _____

Yolanda: _____

Fernando: _____

B. Which student's decimal is correct?

C. Which student's decimal represents the population of the rest of the middle school instead of the eighth-grade class?

Go On ▶

19. Omar has been practicing swimming in his public pool for a swimming race. The farthest he can swim without resting is the diagonal of the pool, which is $\sqrt{200}$ meters.
- The three races available are the 10-meter, the 15-meter, and the 20-meter swim.

A. Between which two races is the length of the pool diagonal that Omar can swim?

B. In which race should Omar compete if he cannot rest during the race?

C. If, in the future, Omar can swim the length of a pool diagonal that measures $\sqrt{400}$ meters, what is the longest race he can swim without resting?

20. As part of a homework assignment, Larry uses a ruler to measure the diameter of various circular objects in his home. He then uses the diameter to find their circumferences. Below are his three circumference measurements.

soup can lid: 2.5π inches

dinner plate: 5π inches

clock: 7.75π inches

- A. Plot these measurements on the line below, using S for soup can lid, D for dinner plate, and C for clock.



- B. The circumference of Larry's wristwatch is 1.5π . Would this measurement be plotted to the left or right of the other household objects on the number line?
-

- C. If the circumference of Larry's Frisbee is exactly 18π inches, which household object has the closest measurement?
-



Domain Assessment • Expressions and Equations

1. Which expression is equal to $(12^4)^{-2}$?

- A. 12^{-6}
- B. 12^{-8}
- C. 12^5
- D. 12^8

2. What is $\sqrt[3]{64}$?

- A. 2
- B. 4
- C. 8
- D. 16

3. Which is equal to $\sqrt{81}$?

- A. 6
- B. 7
- C. 8
- D. 9

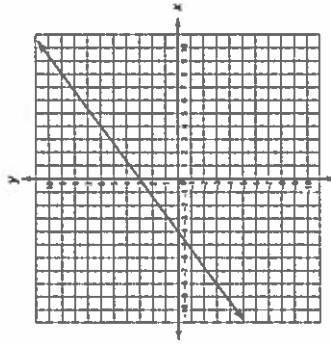
4. Which is 23,578,000 written in scientific notation?

- A. 2.3578×10^6
- B. 23.578×10^6
- C. 2.3578×10^7
- D. 23.578×10^7

5. Which is the quotient of $\frac{4.18 \times 10^7}{1.1 \times 10^{-4}}$?

- A. 3.8×10^6
- B. 3.8×10^{10}
- C. 3.8×10^{14}
- D. 3.8×10^{16}

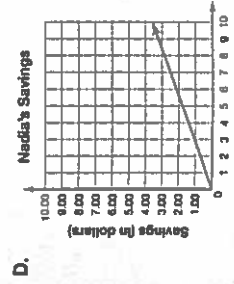
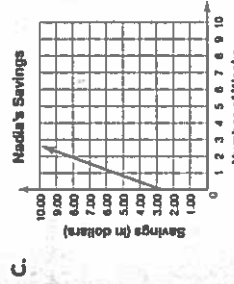
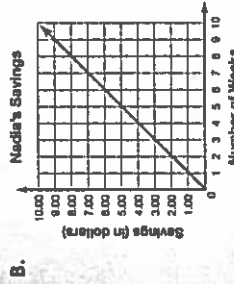
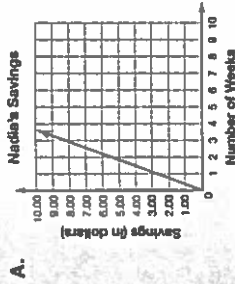
6. Below is the graph of a line.



Which is the slope of the line?

- A. $\frac{1}{2}$
- B. $\frac{3}{4}$
- C. $\frac{3}{3}$
- D. 3

7. Nadia has a savings account that earns interest at a rate of \$2.75 every week. Which graph shows Nadia's earnings over time?



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8. Sunil wants to find a side length of a cube with a volume of 27 cubic units. To find the length of one side, Sunil sets up the following equation: $s^3 = 27$. Which equation below shows the correct value of s ?

- A. $s = \sqrt{27}$
- B. $s = \sqrt[3]{3}$
- C. $s = 3^3$
- D. $s = \sqrt[3]{27}$

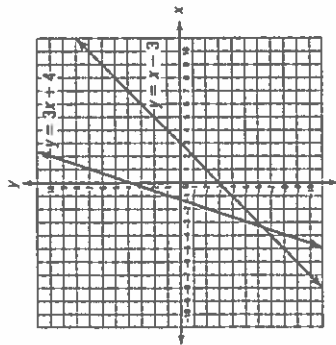
9. What is the solution to $3x + 1 = 4x - 6$?

- A. $x = 5$
- B. $x = 6$
- C. $x = 7$
- D. $x = 8$

10. During a presentation at the Battelle Planetarium, Magdalena learned that the average distance between Earth and the sun is approximately 9.3×10^7 miles. What is the average distance between Earth and the sun in standard form?

- A. 93,000 miles
- B. 930,000 miles
- C. 9,300,000 miles
- D. 93,000,000 miles

11. The equations $y = 3x + 4$ and $y = x - 3$ are graphed below.



What is the solution to this system of linear equations?

- A. $(-3.5, -6.5)$
- B. $(-3.5, 6.5)$
- C. $(3.5, -6.5)$
- D. $(3.5, 6.5)$

12. Neptune is one of the larger planets, with a mass of approximately 1×10^{26} kg. Mercury is the smallest planet, with a mass that is approximately 3×10^{23} kg. About how many times larger than Mercury is Neptune?

- A. 333
- B. 3,333
- C. 33,333
- D. 333,333

13. Solve for x : $-3(2x + 1) + 3x = 6x + 3$

- A. $-\frac{1}{3}$
- B. $-\frac{2}{3}$
- C. $\frac{1}{3}$
- D. $\frac{2}{3}$

14. Which is the best way to find the solution to the following system of linear equations?

$$3x - 2y = 18$$

$$5x + 2y = 14$$

- A. Substitution, because you can easily find the value of x .
- B. Substitution, because you can easily find the value of y .
- C. Elimination, because $-2y$ and $2y$ are opposites.
- D. Elimination, because $3x$ and $5x$ are opposites.

15. Which term is equivalent to $\frac{2^{-3}}{2^7}$?

- A. $\frac{1}{32}$
- B. $\frac{1}{8}$
- C. $\frac{1}{2}$
- D. 2

16. In 2012, with approximately 8.1×10^6 people, New York City is the most populous city in the United States. Los Angeles, California, is the second most populous city in the United States, with about 3.8×10^6 people. Approximately what is the population of the two most populous cities in the United States combined?

- A. 1.1×10^6
- B. 1.9×10^6
- C. 1.19×10^7
- D. 11.9×10^7

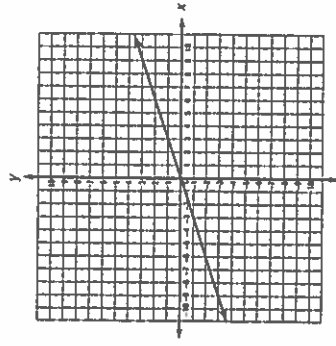
17. What is the solution to $x + 11 + 2x = 7 + 3x + 4$?

- A. $x = 0$
- B. $x = 6$
- C. no solution
- D. infinitely many solutions

18. Loretta calculated the distance she drove from home to her grandmother's house as 5.11×10^7 cm. The distance from Loretta's home to her aunt's house is 5.3×10^7 cm. Which sentence is correct?

- A. Loretta lives closer to her grandmother than to her aunt.
- B. Loretta lives closer to her aunt than to her grandmother.
- C. Loretta lives farther away from her grandmother than from her aunt.
- D. Loretta lives the same distance from her aunt and from her grandmother.

19. Tariq graphed a proportion on the plane below.



What are the equation and the y -intercept of the proportion?

- A. $y = x; (0, 3)$
- B. $y = x + 3; (0, 3)$
- C. $y = \frac{1}{3}x; (0, 0)$
- D. $y = \frac{1}{3}x; (0, 1)$

20. Aidan earned a total of \$117 in one week. His babysitting job pays him \$15 per hour. His after-school job at a barber shop pays him \$9 per hour. He worked a total of 9 hours that week. The system of linear equations represents this situation, where x represents the number of hours Aidan spent babysitting and y represents the number of hours he worked at the barber shop.

$$x + y = 9$$

$$15x + 9y = 117$$

How many hours did Aidan work at each job?

- A. 3 hours babysitting, 6 hours at the barber shop
 B. 6 hours babysitting, 3 hours at the barber shop
 C. 9 hours babysitting, 15 hours at the barber shop
 D. 15 hours babysitting, 9 hours at the barber shop

22. Ms. Prevost wrote a system of linear equations on the board and asked her students how many solutions it had.

$$y = 3x + 4$$

$$y = 3x + 7$$

Abby said it had no solution because the two lines are parallel and therefore cannot intersect. Ileana said it had no solution because $3x - y$ cannot equal both -4 and -7 . Jun said there were infinitely many solutions because they are the same line.

Who is correct?

- A. Abby
 B. Ileana
 C. Jun
 D. both Abby and Ileana

23. A micrometer is equal to 1.0×10^{-6} meters. Which of the following would best be measured in micrometers?

- A. the distance between two planets
 B. the height of a coffee table
 C. the length of a pencil
 D. the width of a strand of hair

21. What is the solution to $3.25x + 1 - 4.25x = -2$?

- A. -3.0
 B. 0.4
 C. 3.0
 D. 4.0

24. 323 tickets were sold at a school talent show to both adults and children. The school earned \$837 from these ticket sales. Adult tickets cost \$5 each and children's tickets cost \$2 each. Which system of linear equations represents this situation?

- A. $a + c = 7$
 $323a + c = 837$
 B. $a + c = 323$
 $2a + 5c = 837$
 C. $a + c = 323$
 $5a + 2c = 837$
 D. $a + c = 837$
 $5a + 2c = 323$

25. Which equation can be used to show the slope of a line with the points $(-2, 5)$ and (x, y) ?

- A. $m = \frac{y-5}{x-2}$
 B. $m = \frac{x-2}{y-5}$
 C. $m = \frac{y-5}{x+2}$
 D. $m = \frac{x+2}{y-5}$

26. What are the slope and y-intercept of the line $y = 3.5x + 8$?

27. What is the solution to the equation $2x + 5 = 6x - 5$? Show your work.

28. Below is a table showing the maximum distance over time that an Adelle penguin can walk.

Time (in hours)	Distance (in miles)
5	12
10	24
15	36
20	48

The distance that an emperor penguin can walk over a period of time is represented by the equation $d = 1.7t$.

A. Which penguin species has a faster maximum walking speed? Show your work.

B. Approximately how long would it take the fastest penguins from both species to walk 3 miles? Show your work.

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29. Below is a system of linear equations.

$$3x + y = 27$$

$$-x + 3y = 11$$

Use elimination to solve the system. Show all your work and prove that your answer is correct.

30. A laundromat sells two varieties of detergent: Sudsy's and Super Clean. The costs of different packages of Sudsy's detergent are shown in the table below.

Sudsy's Detergent

Number of Ounces	Cost of Detergent
5	\$3
10	\$6
15	\$9
20	\$12

The cost of Super Clean detergent can be expressed by the equation $y = 0.6x$, where x is the number of ounces and y is the total price.

Erika determined the unit rate of Sudsy's to be $\frac{3}{1}$, or \$3 per ounce, and the unit rate of Super Clean to be 0.6, or \$0.60 per ounce. Erika then said that Sudsy's is the more expensive detergent.

Why is Erika's answer incorrect? Give the correct answer in your explanation.

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Domain Assessment • Functions

1. Which of the following statements must be true of a function?
- A. Every output value corresponds to only one input value.
 - B. Every input value corresponds to only one output value.
 - C. No input values are repeated.
 - D. No output values are repeated.

2. Each of the tables below shows a relation. Which relation is a function?

A.

Input (x)	1	5	5	7	9
Output (y)	2	8	9	13	21

B.

Input (x)	7	8	9	8	11
Output (y)	3	5	7	6	9

C.

Input (x)	3	7	6	10	15
Output (y)	0	0	0	0	0

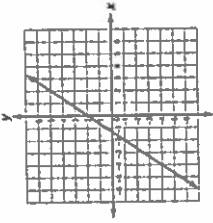
D.

Input (x)	1	1	1	1	1
Output (y)	2	3	4	5	6

3. Pia registered for an account on the Web site of a national magazine. The magazine charges \$5 as a setup fee and \$17 per month for access to the Web site. What is the initial value of the function that represents Pia's cost for access to the magazine's Web site over time?

- A. \$0
- B. \$5
- C. \$17
- D. \$22

4. Ibrahim drew the graph below.



Which of the following statements best describes the graph?

- A. The graph represents a relation but not a function.
- B. The graph represents both a relation and a function.
- C. The graph represents neither a relation nor a function.
- D. There is no relationship between the x- and y-values in the graph.

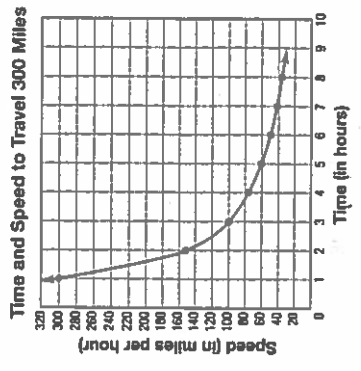
5. André paid a \$65 annual fee to register with a car rental company. The company charges \$8.50 for each hour a car is rented. What is the rate of change of the function that represents André's cost for renting a car over the course of a year?

- A. \$8.50 per hour
- B. \$65 per year
- C. \$73.50 per hour
- D. \$73.50 per year

6. Which of the following is the equation of a nonlinear function?

- A. $y = 25$
- B. $y = x - \frac{3}{4}$
- C. $y = 10x$
- D. $y = x^2 + 15$

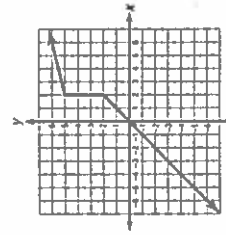
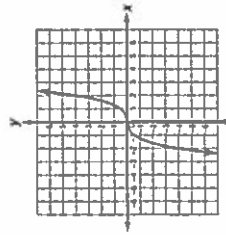
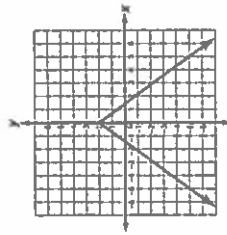
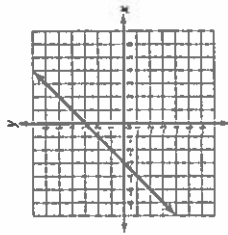
7. The graph below shows the relationship between time and speed for a 300-mile journey.



Which of the following statements is the best description of the functional relationship between the two quantities in the graph?

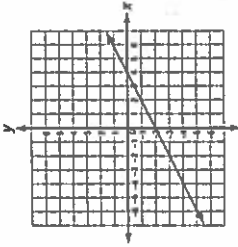
- A. The graph shows a decreasing, nonlinear function. As the time of the journey increases, the speed decreases.
- B. The graph shows an increasing, nonlinear function. As the speed increases, the time of the journey increases.
- C. The graph shows a decreasing, linear function. As the time of the journey increases, the speed decreases.
- D. The graph shows an increasing, linear function. As the speed increases, the time of the journey increases.

8. Which of these graphs does **not** represent a function?



9. The table and graph below represent two functions.

Function A



Function B

x	y
-5	1.75
-2	2.5
0	3
4	4
10	5.5

Which of the following statements is true?

- A. The rate of change for Function A is twice the rate of change for Function B.
- B. The rate of change for Function A is four times the rate of change for Function B.
- C. The rate of change for Function B is twice the rate of change for Function A.
- D. The rate of change for Function B is one-tenth the rate of change for Function A.

10. Orhan studied the relationship between temperature and sales of refreshments at the concession stands inside the football stadium. He wrote an equation for the linear function that relates temperature (x) and refreshment sales (y). Which of the following could be Orhan's equation?

- A. $y = 3x^2 + 25$
- B. $y^2 = 15x + 40$
- C. $y = 11x - 55$
- D. $y = x^3 - 135$

11. A membership at a classic film center costs \$75 per year. Tickets to films cost members \$5.50. Which of the following statements is true of the annual cost of membership at the film center? Let y = total cost and x = number of films seen.

- A. The annual cost is shown by the linear function $y = x + 5.50$. The rate of change is 1, and the initial value is 5.50.
- B. The annual cost is shown by the linear function $y = 75x + 5.50$. The rate of change is 75, and the initial value is 5.50.
- C. The annual cost is shown by the linear function $y = 80.50x$. The rate of change is 80.50, and the initial value is 0.
- D. The annual cost is shown by the linear function $y = 5.50x + 75$. The rate of change is 5.50, and the initial value is 75.

12. The ordered pairs shown below represent a function.

- $(-2, -17.5)$, $(5, 8.75)$, $(0, -10)$,
 $(-1, -13.75)$, $(3, 1.25)$

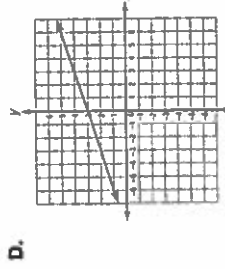
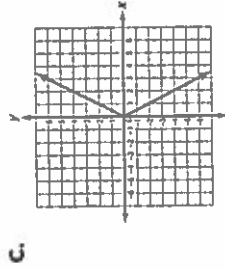
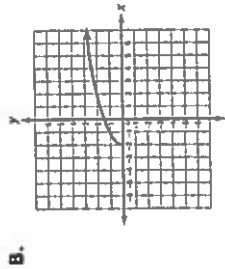
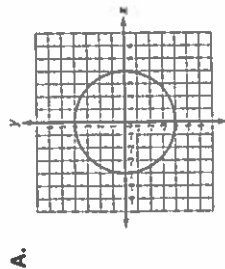
What is the rate of change of the function? Round to the nearest hundredth if necessary.

- A. -3.75
- B. -0.27
- C. 0.27
- D. 3.75

13. Which of the following sets of ordered pairs represents a function?

- A. $(-1, 15)$, $(0, 10)$, $(0, 5)$, $(2, 5)$, $(5, -5)$
- B. $(-7, -1)$, $(-7, 0)$, $(-7, 1)$, $(-7, 2)$, $(-7, 3)$
- C. $(-5, 10)$, $(-3, 6)$, $(0, 0)$, $(3, 6)$, $(5, 10)$
- D. $(-8, 3)$, $(-4, 3)$, $(0, 3)$, $(0, 5)$, $(4, 5)$

14. Which of the following graphs represents a nonlinear function?



15. Ms. Guidry wrote the equation $y = mx + b$ on the board. Lynne claimed that the equation does not represent a linear function. Amy said that $y = mx + b$ is the equation of a linear function. Which of the following statements is true?

- A. Amy is correct because $y = mx + b$ relates two variables, and neither of the variables is raised to a power greater than 1.
 B. Lynne is correct because $y = mx + b$ relates two variables, but one variable (x) is raised to a power (m).
 C. Amy is correct because $y = mx + b$ relates two variables, and both variables have only integer values.
 D. Lynne is correct because $y = mx + b$ relates four variables.

16. Which of the following sets of ordered pairs does **not** represent a function?

- A. $(-6, 0), (3, 0), (-2, 0), (0, 0), (9, 0)$
 B. $(3.5, -1), (3.5, -5), (3.5, 10), (3.5, 0), (3.5, -1.5)$
 C. $(\frac{1}{2}, 1), (\frac{3}{4}, 1\frac{1}{2}), (0, 0), (2\frac{1}{4}, 4\frac{1}{2}), (3\frac{1}{10}, 6\frac{1}{2})$
 D. $(-9, -3), (\frac{4}{5}, \frac{4}{15}), (\frac{6}{7}, \frac{2}{7}), (-\frac{1}{4}, -\frac{1}{12}), (1\frac{2}{3}, \frac{3}{5})$

17. Mr. Carter asked his class to compare the rates of change for the functions shown below.

Function A

x	y
-6	$-1\frac{2}{3}$
-4	$-\frac{2}{3}$
0	2
2	$3\frac{1}{3}$
9	$7\frac{2}{3}$

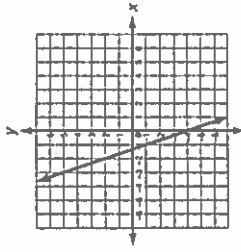
Function B

$$y = \frac{5}{3}x + 6$$

- Which of the following statements is true?

- A. The rate of change for Function A is greater than the rate of change for Function B.
 B. The rate of change for Function B is three times the rate of change for Function A.
 C. The rate of change for Function B is greater than the rate of change for Function A.
 D. The rates of change for Function A and Function B are equal.

18. Corinne drew the graph of a linear function, as shown below.



- What is the rate of change of the function?

- A. -3
 B. $-\frac{1}{3}$
 C. $\frac{1}{3}$
 D. 3

19. Lidija created the table of values shown below.

x	y
-2.75	3
7.5	-7.25
0	-7.25
-2.75	5
-3.25	3.5

Which of the following statements best explains why the table of values does **not** represent a function?

- A. At least one y -value is repeated.
- B. At least one x -value is repeated.
- C. At least one y -value has more than one corresponding x -value.
- D. At least one x -value has more than one corresponding y -value.

20. During his winter vacation, George rented skis and boots for 5 days from the Slope Slayer Ski Shop. The shop charges the same rate for each day of a rental. Including a \$7.50 application fee, George paid a total of \$177.25 to rent skis and boots.

What is the rate of change, in dollars per day, for the function that represents George's rental cost?

- A. 7.50
- B. 33.95
- C. 35.45
- D. 42.95

21. Cecilia decided to start a savings plan. On January 1, she opened a bank account and made a deposit. She then made monthly deposits without ever taking money out of the account. At the end of each month, she recorded the total amount in her savings account. The table below shows her data for the first five months of the year.

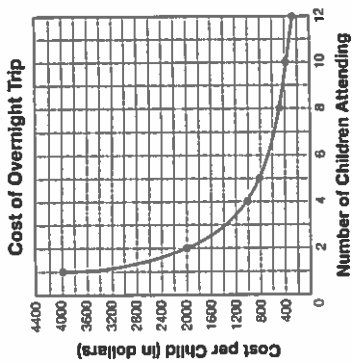
Date	Account Balance
January 31	\$110
February 28	\$120
March 31	\$130
April 30	\$140
May 31	\$150

What is the initial value, in dollars, for the function that represents Cecilia's total savings? Explain your answer.

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22. Mr. Posada graphed the function that relates the cost of an overnight trip to the number of children attending, as shown below.



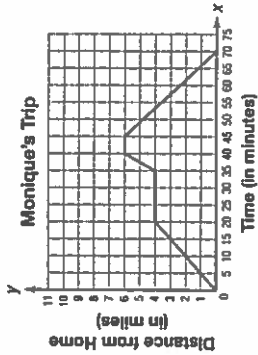
Use the words *increasing* or *decreasing* and *linear* or *nonlinear* to describe the graph. Explain your answer.

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23. Ms. Dehejia asked her class to graph the following situation:

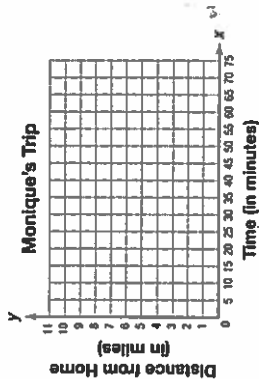
Monique took 15 minutes to bike the 4 miles from her house to her friend Angela's house. She spent another 15 minutes talking to Angela. Then she took 10 minutes to bike the 2 miles from Angela's house to the library. She stayed at the library for 5 minutes to return a book. Finally, she took 25 minutes to bike home.

Enrique drew the graph below to represent the situation.



- A. Does Enrique's graph correctly represent the situation? Explain your answer.

- B. Graph the situation Ms. Dehejia presented to her class.



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24. An online movie rental service charges a one-time registration fee. The cost of downloading each movie is the same. The table below shows the total costs, including the application fee, for downloading different numbers of movies.

Cost of Downloading Movies

Total Number of Movies	Total Cost (in dollars)
5	41.25
10	57.50
15	73.75
20	90.00
25	106.25

- A. Write the equation of the function that represents the total cost of downloading different numbers of movies. Identify the rate of change and the initial value of the function. Let y = total cost and x = number of movies.

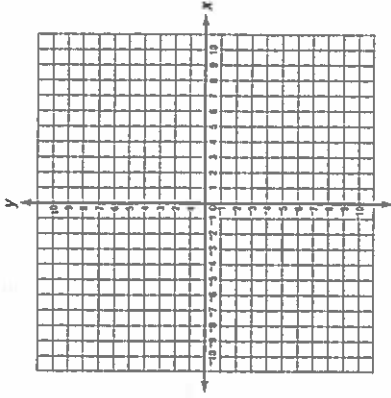
- B. What would be the total cost of registering for the movie rental service and renting 125 movies? Explain your answer.

Go On ▶

25. Harumi created the table of values shown below.

x	-3	-1	0	2	3	4
y	3	-5	-6	-2	3	10

- A. Graph the ordered pairs shown in the table. Then connect the points.



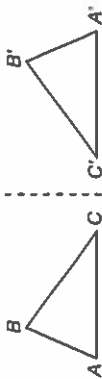
- B. Does Harumi's table of values represent a function? If so, is the function linear or nonlinear? Explain your answers.



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Domain Assessment • Geometry

1. Triangle ABC is reflected over a line forming triangle A'B'C'.



Suppose triangle ABC is scalene. Which line segment in triangle A'B'C' is the same length as line segment BC?

- A. $\overline{A'B'}$
- B. $\overline{A'C'}$
- C. $\overline{B'C'}$
- D. $\overline{C'A'}$

2. Rectangle JKLM has points at $(-2, 2)$, $(1, 2)$, $(1, -2)$, and $(-2, -2)$, respectively. After a transformation of rectangle JKLM, rectangle J'K'L'M' is formed with points at $(-1, 1)$, $(2, 1)$, $(2, -3)$, and $(-1, -3)$. Describe the transformation.

- A. Rectangle JKLM was reflected over the origin.
- B. Rectangle JKLM was translated 1 unit down and 1 unit to the right.
- C. Rectangle JKLM was rotated 90° about point L.
- D. Rectangle JKLM was dilated with a scale factor of 1.

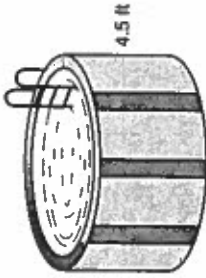
3. Kite ABCD is similar to kite EFGH.



Which rigid and non-rigid motions could be performed on kite ABCD to produce kite EFGH?

- A. Rotate 90° , then dilate with a scale factor of 2.
- B. Rotate 90° , then dilate with a scale factor of $\frac{1}{2}$.
- C. Translate to the left, then dilate with a scale factor of 2.
- D. Translate to the right, then dilate with a scale factor of $\frac{1}{2}$.

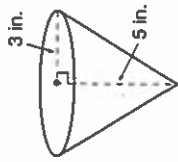
4. Nixoi will be sitting on top of the dunk tank at her school's carnival fund-raiser. She wants to find the volume of the tank so she can figure out how much water she will need to fill it. The tank is 4.5 feet deep and has a circumference of approximately 31.4 feet.



What is the approximate volume of the tank? Use 3.14 for π .

- A. 62.8 ft^3
- B. 125.6 ft^3
- C. 353 ft^3
- D. $1,256 \text{ ft}^3$

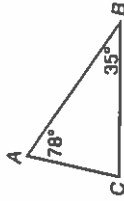
5. The cone below has a height of 5 inches and a radius of 3 inches.



What is the approximate volume of the cone? Use 3.14 for π .

- A. 15.7 in.^3
- B. 47.1 in.^3
- C. 78.5 in.^3
- D. 141.3 in.^3

6. In triangle ABC, the measure of angle A is 78 degrees and the measure of angle B is 35 degrees.

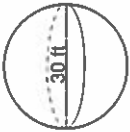


What is the measure of angle C?

- A. 67°
- B. 70°
- C. 77°
- D. 102°

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7. The sphere below has a diameter of 30 feet.



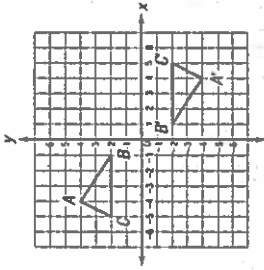
Approximately, which is the volume of the sphere? Use 3.14 for π .

- A. 10,597 ft³
- B. 13,040 ft³
- C. 14,130 ft³
- D. 87,780 ft³

8. Jayme drew triangle LMN on a coordinate grid. The coordinates of the vertices of triangle LMN were (3, 6), (9, 6), and (3, 2), respectively. Jayme then dilated the triangle to produce triangle L'M'N', with vertices whose coordinates were (3, 6), (6, 6), and (3, 4). Which is the scale factor for this dilation?

- A. $\frac{1}{16}$
- B. $\frac{1}{8}$
- C. $\frac{1}{4}$
- D. $\frac{1}{2}$

9. Triangle ABC and triangle A'B'C' are shown on the coordinate plane below.



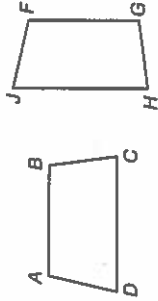
Which sequence of rigid motions shows that triangle ABC is congruent to triangle A'B'C'?

- A. reflection over the y-axis, then 180° rotation about the origin
- B. reflection over the y-axis, then reflection over the x-axis
- C. reflection over the y-axis, then translation of 8 units down
- D. reflection over the y-axis, then reflection over the origin

10. The Marysville Fire Department was sent to rescue a cat from a tree. The firefighters laid a 25-foot ladder against the tree at a height of 24 feet. How far was the ladder from the tree?

- A. 5 ft
- B. 6 ft
- C. 7 ft
- D. 8 ft

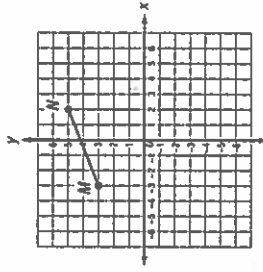
11. Trapezoid ABCD is rotated 90 degrees to produce trapezoid FGHI.



Line segment AB is parallel to line segment DC. Which is true?

- A. \overline{AB} is parallel to \overline{AD} .
- B. \overline{AD} is parallel to \overline{BC} .
- C. \overline{FG} is parallel to \overline{IH} .
- D. \overline{FI} is parallel to \overline{GH} .

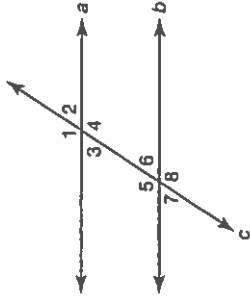
12. Below is a graph of line segment MN.



What is the length of line segment MN?

- A. 2
- B. $\sqrt{5}$
- C. 5
- D. $\sqrt{29}$

13. Lines a and b are parallel lines cut by the transversal c.



If the measure of angle 5 is 123 degrees, what is the measure of angle 2?

- A. 57°
- B. 123°
- C. 157°
- D. 180°

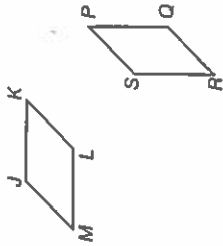
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14. Parallelogram JKLM and parallelogram PQRS are shown below.



Which describes a sequence of rigid motions that show the parallelograms are congruent?

- A. reflection, then downward translation
- B. dilation by a scale factor of $\frac{1}{2}$, then reflection
- C. upward translation, then 90° rotation
- D. 90° rotation, then downward translation

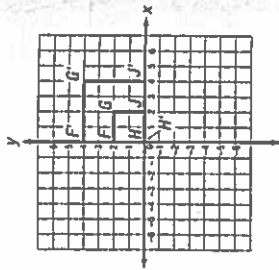
15. Triangle RST is translated to the right to form triangle R'S'T'. The measure of angle R is 27 degrees.



What is the measure of angle R'?

- A. 27°
- B. 33°
- C. 127°
- D. 147°

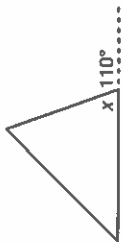
16. Square FGHJ was dilated to form square F'G'H'J'. The center of dilation was at the origin.



What scale factor was used?

- A. $\frac{1}{2}$
- B. $\frac{1}{4}$
- C. 2
- D. 4

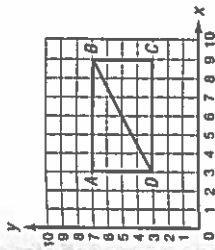
17. The triangle below has an exterior angle of 110 degrees.



What is the value of x?

- A. 70°
- B. 80°
- C. 90°
- D. 110°

18. Line segment BD is a diagonal of rectangle ABCD.



What is the length of line segment BD?

- A. 2.3
- B. 4.4
- C. 6.21
- D. $7.2\sqrt{1}$

20. Triangle ABC has vertices at A(0, 4), B(2, 10), and C(8, 8) and is dilated by a scale factor of $\frac{1}{4}$, with the origin used as the center of dilation, to produce the image A'B'C'. What are the coordinates of the vertices of the dilated image A'B'C'?

- A. A'(0, 1), B'(0.5, 2), C'(4, 4)
- B. A'(0, 1), B'(0.5, 2.5), C'(2, 2)
- C. A'(1, 1), B'(2, 2), C'(4, 4)
- D. A'(1, 0), B'(2.5, 2.5), C'(2, 2)

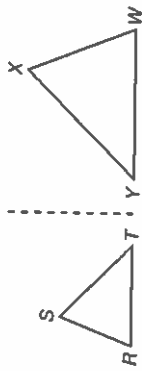
19. Which is **not** a right triangle?

- A.
- B.
- C.
- D.

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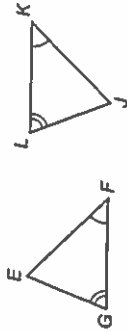
21. Triangle RST is similar to triangle WXY .



Identify the type of rigid and/or nonrigid motions that are needed to show this.

22. A basketball has a diameter of 29.5 inches. If the basketball is fully inflated, about how many cubic inches of air will it hold? Use 3.14 for π . Show your work.

23. Triangles EFG and JKL are shown below.



A. Are the triangles similar? Explain why or why not.

B. Give an example of additional information that could be used to conclude that the triangles are congruent. Explain.

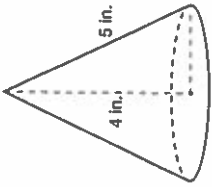
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24. The cone below has a slant height of 5 inches and a height of 4 inches.



- A. What is the diameter of the base of the cone? Show all work and label your answer with the correct units.

- B. What is the volume of the cone? (Hint: $V = \frac{1}{3}Bh$, where B is the area of the base.) Show all work and label your answer with the correct units.

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25. Liam drew a right triangle, triangle DEF , with side lengths of 7 inches, 24 inches, and 25 inches. Use the converse of the Pythagorean theorem to prove that triangle DEF is a right triangle. Show your work.

- B. Use a model to verify the Pythagorean theorem.

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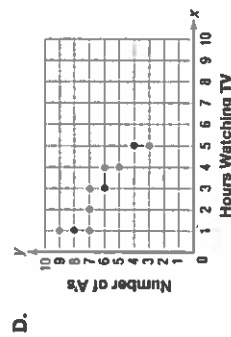
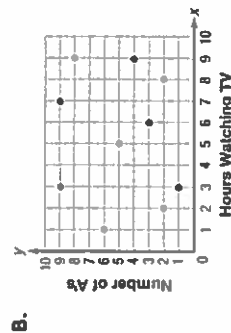
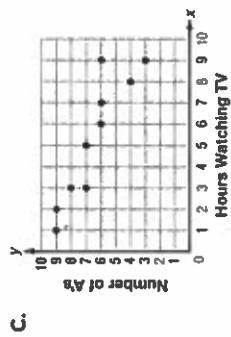
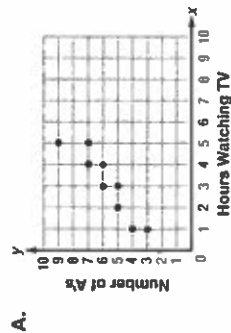


Domain Assessment • Statistics and Probability

1. Mr. Jain gives his class a quiz every Monday. He randomly surveyed some of his students to see if there was a relationship between weekend hours spent watching TV and quiz scores. Mr. Jain's data are shown in the table below.

Weekend TV Hours and Quiz Scores		
Mean Number of Weekend Hours Watching TV	Number of A's on Quizzes	
1	8	
3	6	
5	4	
2	7	
1	9	
4	6	
3	7	
1	7	
5	3	
4	5	

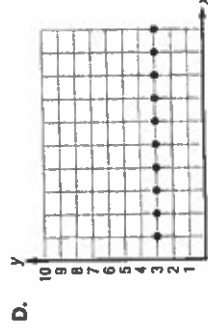
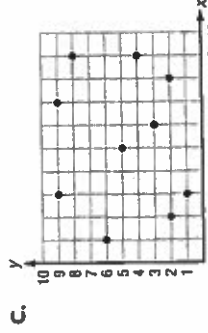
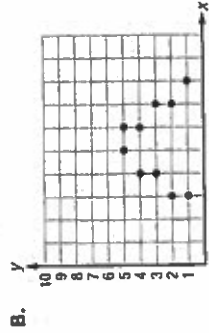
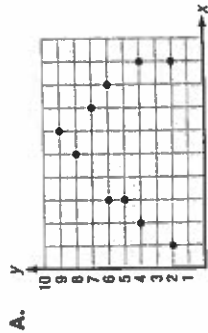
Which of the scatter plots below best represents Mr. Jain's data?



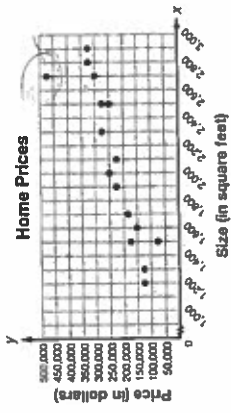
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2. Which of the scatter plots below best shows clustering of the data?



3. Malik is a real estate agent. He created a scatter plot to examine the relationship between the size of a home and its price, as shown below.

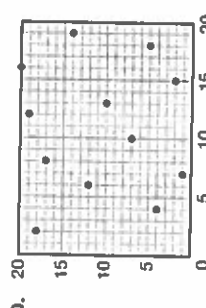
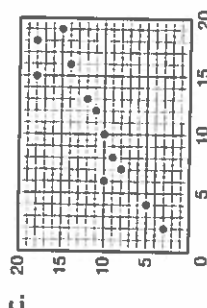
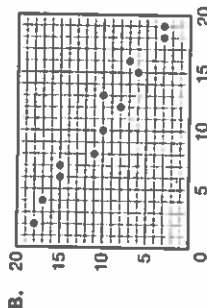
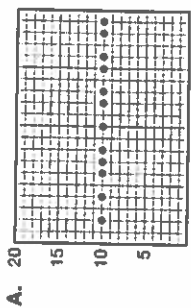


Which of the following statements best describes the data in Malik's scatter plot?

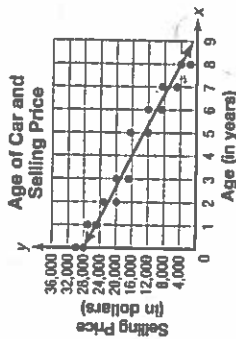
- A. The data show a positive nonlinear association with clustering and outliers.
- B. The data show a positive linear association with no clustering or outliers.
- C. The data show a positive linear association with no clustering, but with outliers.
- D. The data show a negative linear association with clustering, but with no outliers.

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4. Which of the scatter plots below best represents a positive linear association for the data?



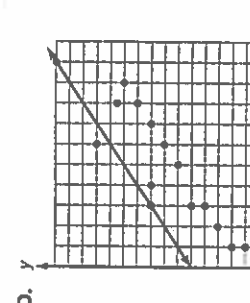
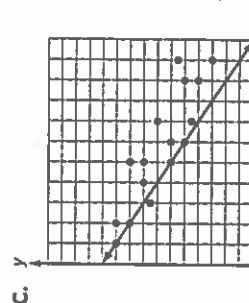
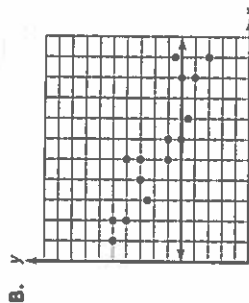
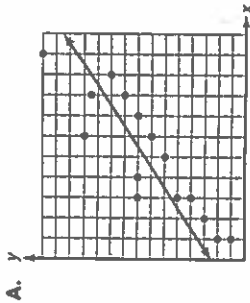
5. The owner of a car dealership recorded the ages and selling prices of cars sold over one weekend at the dealership. She displayed the data in a scatter plot and then drew a line of best fit, as shown below.



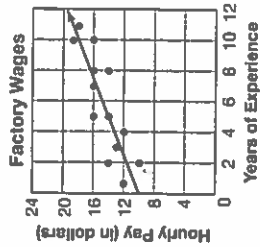
Which statement is true about the line of best fit in the owner's scatter plot?

- A. The data do not appear to have a linear association, so a line of best fit is not an appropriate model for the data.
 B. The line of best fit does not show the correct linear association.
 C. The line of best fit shows the correct linear association but does not include enough data points.
 D. The line of best fit shows the correct linear association and closely models the data points.

6. Which scatter plot shows the line that best fits the given data?



7. The president of a union of factory employees used a random sample to collect data on the number of years of experience and the hourly wages of the factory employees. She then created a scatter plot with the data and drew a line of best fit, as shown below.



Which of the following statements best describes the meaning of the y-intercept of the line of best fit in the scatter plot?

- A. A factory employee's hourly wage increases by about \$0.80 for every additional year of experience.
 B. A factory employee with no experience will start with an hourly wage of about \$10.00.
 C. A factory employee with more than 10 years of experience will have an hourly wage of more than \$18.00.
 D. The maximum hourly wage at the factory is \$24.00.

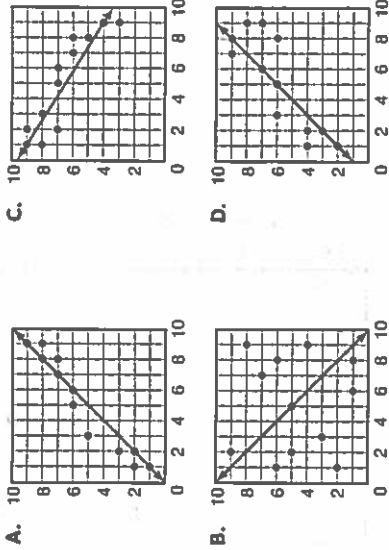
8. Emily surveyed a random sample of adults in her neighborhood. She asked each person whether he or she is a vegetarian and whether he or she recycles regularly. The responses to Emily's survey are shown in the table below. In the table, a yes answer is marked by a Y and a no answer is marked by an N.

Vegetarian? Recycle?	N	N	N	N	N	N	N	N	N	N
Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y
N	N	N	N	N	N	N	N	N	N	N

Which two-way table best displays Emily's data?

- A.
- | | Vegetarian | Not Vegetarian | Total |
|-------------|------------|----------------|-------|
| Recycle | 10 | 3 | 13 |
| Not Recycle | 1 | 1 | 2 |
| Total | 11 | 4 | 15 |
- B.
- | | Vegetarian | Not Vegetarian | Total |
|-------------|------------|----------------|-------|
| Recycle | 4 | 9 | 13 |
| Not Recycle | 0 | 2 | 2 |
| Total | 4 | 11 | 15 |
- C.
- | | Vegetarian | Not Vegetarian | Total |
|-------------|------------|----------------|-------|
| Recycle | 9 | 4 | 13 |
| Not Recycle | 2 | 0 | 2 |
| Total | 11 | 4 | 15 |
- D.
- | | Vegetarian | Not Vegetarian | Total |
|-------------|------------|----------------|-------|
| Recycle | 3 | 10 | 13 |
| Not Recycle | 1 | 1 | 2 |
| Total | 4 | 11 | 15 |

9. Which scatter plot does **not** show the line that best fits the given data?



10. As part of a project on voting patterns in Akron, Mr. Eng asked his social studies class to survey adults at random about whether they had voted in the most recent mayoral and presidential elections. The results of the class's survey are shown in the table below.

	President: Yes	President: No	Total
Mayor: Yes	143	17	160
Mayor: No	105	190	295
Total	248	207	455

Based on the data in the table, which of the following statements is true?

- A. More people voted for president than voted for mayor.
 B. More people voted for mayor than voted for president.
 C. The same number of people voted for president as voted for mayor.
 D. More people voted for both president and mayor than did not vote at all.

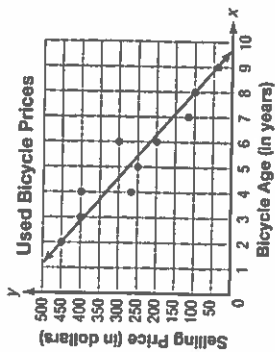
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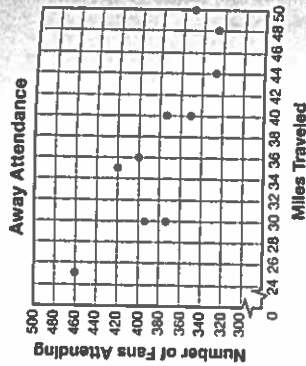
11. Vivian spent the summer working at a bicycle shop. One week, the owner asked her to collect data on the ages and selling prices of the bicycles sold that week. Vivian displayed her data in a scatter plot and drew a line of best fit, as shown below.



According to Vivian's line of best fit, which of the following statements is true?

- There is no correlation between the age of a bicycle and its selling price.
- There is a correlation between the age of a bicycle and its selling price, but it is nonlinear.
- The selling price of a bicycle drops by about \$60 per year.
- The selling price of a bicycle rises by about \$60 per year.

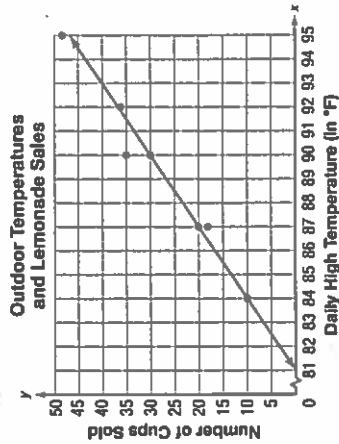
12. The owners of a minor league baseball team collected data to see how many of their team's fans traveled to the team's away games. The data is displayed in the scatter plot below.



Which of the following statements best describes the data in the scatter plot?

- There does not seem to be any association between miles traveled and fan attendance.
- There seems to be a nonlinear association between miles traveled and fan attendance.
- There seems to be a positive linear association in the data. The more fans the team has, the farther they will travel for a game.
- There seems to be a negative linear association in the data. The farther that fans need to travel for a game, the fewer fans attend the game.

13. Every summer, Gus and Nick run a lemonade stand in front of their family's home. For one week, they collected data on temperature and sales of lemonade. Gus and Nick then displayed their data in a scatter plot and drew a line of best fit, as shown below.



Based on the data in Gus and Nick's scatter plot, what is the effect on lemonade sales of an increase in temperature of 1 degree Fahrenheit?

- Lemonade sales increase by a little more than \$3.00.
- Lemonade sales increase by a little less than \$3.00.
- Lemonade sales drop by a little less than \$3.00.
- There is no correlation in the data, so temperature does not affect lemonade sales.

14. Liam wanted to find out whether there is an association between playing a musical instrument and scores on math tests. He asked the students in his math class whether they play a musical instrument and whether their mean test score is at least 85. The results of his survey are shown in the relative frequency table below.

	Instrument	No Instrument	Total
At Least 85	69%	56%	64%
Less Than 85	31%	44%	36%
Total	100%	100%	100%

Based on the data in the table, which of the following statements is true?

- Students who play a musical instrument are less likely than students who do not play a musical instrument to have a mean test score of at least 85.
- Students who play a musical instrument are more likely than students who do not play a musical instrument to have a mean test score of at least 85.
- Students who play a musical instrument are as likely as students who do not play a musical instrument to have a mean test score of at least 85.
- Students who do not play a musical instrument are less likely to have a mean test score of at least 85.

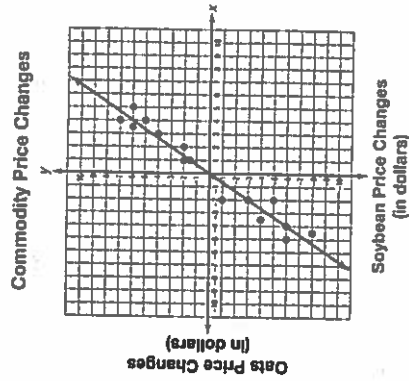
15. Hayes Middle School is conducting a survey of students to choose a new school mascot. The choice is either a lion or a cardinal. The results of the survey are shown in the table below.

	Boys	Girls	Total
Lion	270	268	538
Cardinal	193	269	462
Total	463	537	1,000

Based on the data in the table, which of the following statements is true?

- There are fewer boys who prefer a lion than there are girls who prefer a cardinal.
- More girls prefer a lion than prefer a cardinal.
- The number of boys who prefer a lion is about equal to the number of girls who prefer a lion.
- The number of boys who prefer a cardinal is about equal to the number of girls who prefer a cardinal.

16. A commodities trading company tracked the price changes for soybean futures and oats futures over a period of weeks. The data, along with a line of best fit, are shown below.



What is the y-intercept of the line of best fit for the commodities price change data? What does the y-intercept mean in the context of the data? Explain your answer.

19. A randomly selected group of adults was surveyed about whether they exercise regularly and whether they have annual checkups with their doctors. The results of the survey are shown in the table below. In the table, a yes answer is marked by a Y and a no answer is marked by an N.

Exercise	N	Y	Y	Y	Y	Y	N	N	N	N	Y	Y	Y	N	Y
Annual Checkup	Y	Y	N	Y	Y	N	Y	N	N	N	Y	Y	Y	Y	Y

- A. Create a two-way table for the survey data.
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- B. Based on the survey data, are people more likely to have an annual checkup if they exercise regularly? Explain your answer.

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20. Lupe had heard that left-handed people are more artistic than right-handed people. She surveyed students at her school at random to ask whether they were left-handed and whether they took an art class. The results of Lupe's survey are shown in the table below.

	Left-handed	Right-handed
Art Class	5	39
No Art Class	7	49
Total	12	88

- A. Use the data in Lupe's table to create a two-way table with relative frequencies.
- | | | |
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- B. Do Lupe's data support the idea that left-handed people are more artistic than right-handed people? Explain your answer.



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