

Multiple Choice

Identify the choice that best completes the statement or answers the question.

_____ 1. Which is a more precise measurement?

- a. 13.2
- b. 13
- c. 13.24
- d. 13.240

_____ 2. Which is the correct conversion factor for converting km to miles. (1 mile = 1.609 km)

- a. $\frac{1.609 \text{ km}}{1 \text{ mile}}$
- b. $\frac{1.609 \text{ mile}}{1 \text{ m}}$
- c. $\frac{1 \text{ mile}}{1.609 \text{ km}}$
- d. $\frac{1 \text{ m}}{1.609 \text{ mile}}$

_____ 3. Write the expression $\sqrt[11]{10^8}$ by using rational exponents.

- a. $10^{\frac{8}{11}}$
- b. 10^3
- c. 10^{-3}
- d. $10^{\frac{11}{8}}$

_____ 4. Write the expression $8^{\frac{5}{3}}$ in radical form, and simplify. Round to the nearest whole number if necessary.

- a. $(\sqrt[5]{8})^3; 3$
- b. $\sqrt[5]{8}; 32$
- c. $(\sqrt[3]{8})^5; 32$
- d. $\frac{8^5}{8^3}; 64$

_____ 5. Write two algebraic expressions for the square root of x .

- a. $x^2; \sqrt{x^2}$
- b. $x^{\frac{1}{2}}; \sqrt{x}$
- c. $x^{\frac{1}{3}}; \sqrt[3]{x}$
- d. $x^{\frac{1}{2}}; \sqrt{x^2}$

_____ 6. Simplify $\left(x^{\frac{1}{9}}\right)^9$.

- a. x^9
- b. x
- c. 0
- d. 1

- ___ 7. Which of the following is not a rational number?
- a. The Product of 2 and 0.3333... c. The sum of $\frac{3}{7}$ and $\frac{1}{2}$
- b. The sum of $2 + \sqrt{3}$ and $5 - \sqrt{3}$ d. The Product of 2 and $\sqrt{2}$
- ___ 9. A parking lot holds 42 cars. There are 26 cars in the lot already. Which inequality can be solved to show all the numbers of cars c that can still park in the lot?
- a. $26 + c < 42$ c. $26 + 42 < c$
- b. $26 + c \leq 42$ d. $26 + 42 \leq c$
- ___ 10. Leroy works part time for a moving company. One day he had to move 34 boxes from a truck to inside a house. After moving some boxes, he took a break and told his boss that he has only 15 more boxes to move. Which equation can be solved to find how many boxes Leroy moved before his break?
- a. $15 + 34 = x$ c. $34 - x = 15$
- b. $15 - x = 34$ d. $34 + x = 15$
- ___ 11. A painter is working on a canvas that has a total area of 338 square inches. The canvas is x inches wide and twice as long as it is wide. Find the value of x .
- a. 13 c. 112.7
- b. 18.4 d. 169
- ___ 12. Jennifer, Luis, Robert, Anna, and Tonya are figuring out how to split the check for lunch. The total bill, with tax and tip, is \$65.45. Anna puts in \$15, and Tonya puts in \$8. The rest of the group splits the rest of the bill equally. Which equation and solution represent the amount a that each of the remaining people pay?
- a. $3a + 23 = 65.45$; $a = \$14.15$
- b. $5a = 65.45 + 15 + 8$; $a = \$17.69$
- c. $3a = 88.45$; $a = \$29.49$
- d. $5a + 23 = 65.45$; $a = \$8.49$
- ___ 13. Solve the equation $4x - 6 = 34$. Write a reason for each numbered step.
- | | |
|--|------------------|
| $4x - 6 = 34$ | Given |
| $\begin{array}{r} 4x - 6 \\ +6 \quad +6 \\ \hline 4x \end{array} = 40$ | [1]
Simplify. |
| $\frac{4x}{4} = \frac{40}{4}$ | [2] |
| $x = 10$ | Simplify. |
- a. [1] Addition Property of Equality;
[2] Division Property of Equality
- b. [1] Addition Property of Equality;
[2] Distributive Property
- c. [1] Division Property of Equality;
[2] Subtraction Property of Equality
- d. [1] Multiplication Property of Equality;
[2] Distributive Property

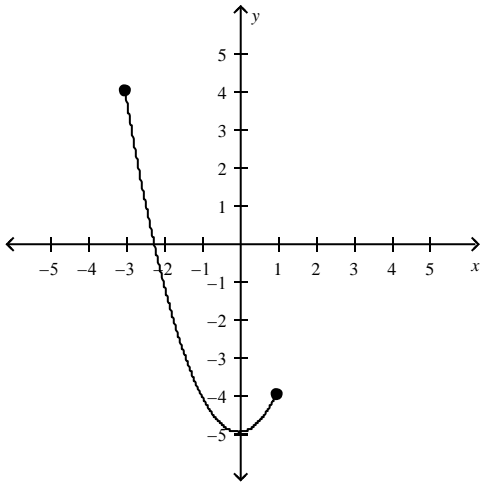
___ 14. Which of the following relations is NOT a function?

- a. $\{(2, 1), (4, 3), (6, 5), (8, 7)\}$
- b. $\{(2, 1), (4, 3), (6, 5), (8, 5)\}$
- c. $\{(2, 1), (4, 3), (6, 5), (2, 7)\}$
- d. $\{(2, 1), (4, 1), (6, 5), (8, 7)\}$

___ 15. Which of the following relations is a function?

- a. $\{(1, -6), (3, -5), (1, 0)\}$
- b. $\{(0, 5), (5, -1), (5, 9)\}$
- c. $\{(6, 1), (6, 2), (6, 3)\}$
- d. $\{(0, 8), (1, 7), (2, 6)\}$

___ 16. Give the domain and range of the relation. Tell whether the relation is a function.



- a. D: $-5 \leq x \leq 4$; R: $-3 \leq y \leq 1$
The relation is not a function.
- b. D: $-5 \leq x \leq 4$; R: $-3 \leq y \leq 1$
The relation is a function.
- c. D: $-3 \leq x \leq 1$; R: $-5 \leq y \leq 4$
The relation is a function.
- d. D: $-3 \leq x \leq 1$; R: $-5 \leq y \leq 4$
The relation is not a function.

___ 17. Write an algebraic expression that represents 2 less than 18 times a number?

- a. $18(x - 2)$
- b. $2 - 18x$
- c. $18x - 2$
- d. $2x - 18$

___ 18. Hana makes beaded bracelets for sale. The materials for each bracelet cost \$2.00 and she sells the bracelets for \$7.25 each. To find her profits, she writes the equation $p = 7.25x - 2.00x$. Explain what the variable x represents.

- a. profit from the sales
- b. cost of materials
- c. number of bracelets sold
- d. total amount of sales

___ 19. Describe the error Tamba made when simplifying the expression shown.
 $4(3x - 1) = 12x - 1$

- a. The coefficient in the simplified expression is not 12.
- b. The common terms were not collected.
- c. The factor was not multiplied by both terms.
- d. The expression was changed from one term into two.

___ 20. Julia wrote 14 letters to friends each month for y months in a row. Write an expression to show how many total letters Julia wrote.

- a. $14y$
- b. $14 + y$
- c. $14 - y$
- d. $\frac{14}{y}$

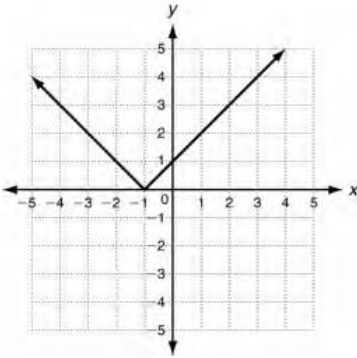
___ 21. Juan scored 26 points in the first half of the basketball game, and he scored n points in the second half of the game. Write an expression to determine the number of points he scored in all. Then, find the number of points he scored in all if he scored 18 points in the second half of the game.

- a. $26 + n$; 44 points
- b. $\frac{26}{n}$; 8 points
- c. $26n$; 44 points
- d. $26 - n$; 8 points

___ 22. For $f(x) = -5x + 4$, what is the value of x for which $f(x) = 29$?

- a. $x = 1$
- b. $x = -5$
- c. $x = -4$
- d. $x = 5$

___ 23. What is the value of $f(x)$ when $x = -3$?

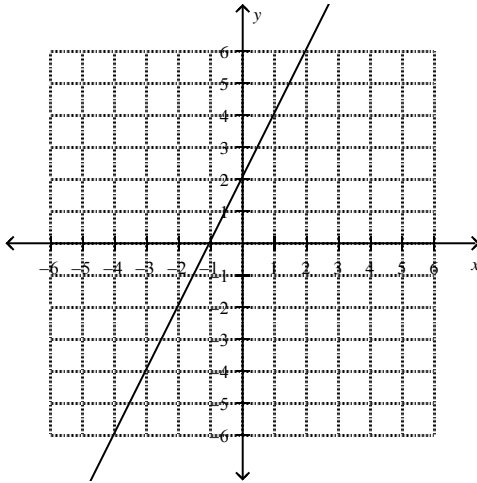


- a. -4
- b. -2
- c. 2
- d. 4

___ 24. Which ordered pair does NOT lie on the graph of $h(x) = -2x + 7$?

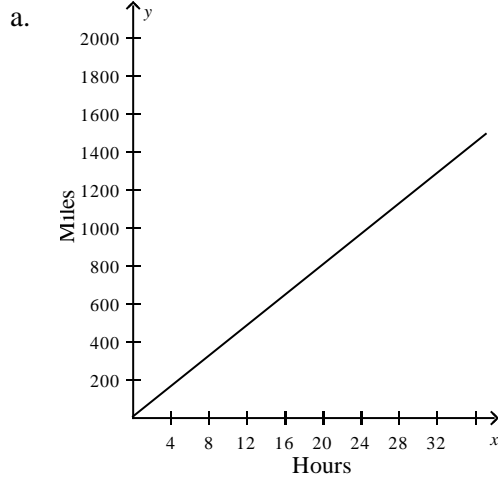
- a. $(-2, 3)$
- b. $(-1, 9)$
- c. $(3, 1)$
- d. $(4, -1)$

- ___ 25. Use the graph of the function $f(x) = 2x + 2$ to find the value of y when $x = 2$.

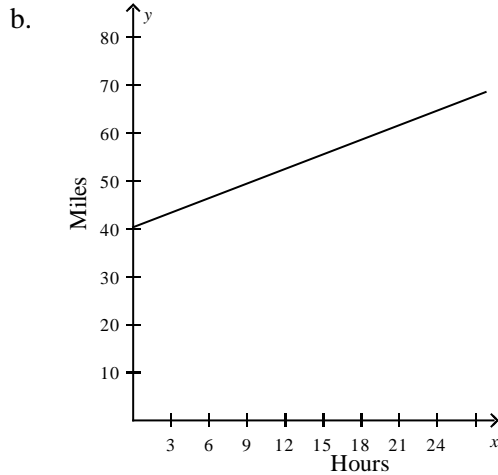


- a. -2
b. 7
c. 6
d. 0
- ___ 26. For $f(x) = -5x - 2$, evaluate $f(5)$.
a. -32
b. -27
c. 23
d. -15
- ___ 27. Brian has 64 flowers for a big party decoration. In addition, he is planning to buy some flower arrangements that have 18 flowers each. All of the arrangements cost the same. Brian is not sure yet about the number of flower arrangements he wants to buy, but he has enough money to buy up to 5 of them. Write a function to describe how many flowers Brian can buy. Let x represent the number of flower arrangements Brian buys. Find a reasonable domain and range for the function.
a. $f(x) = 18x + 64$; D: $\{0, 1, 2, 3, 4\}$; R: $\{64, 82, 100, 118, 136\}$
b. $f(x) = 18x + 64$; D: $\{0, 1, 2, 3, 4, 5\}$; R: $\{64, 82, 100, 118, 136, 154\}$
c. $f(x) = 64x + 18$; D: $\{1, 2, 3, 4\}$; R: $\{82, 100, 118, 136, 154\}$
d. $f(x) = 64x + 18$; D: $\{5\}$; R: $\{154\}$
- ___ 28. Find an explicit function rule for the following sequence defined over the natural numbers: $-7, -1, 9, 23, \dots$
a. $f(n) = 2n^2 - 9$
b. $f(n) = 9n^2 + 2$
c. $f(n) = 2n^2 + 9$
d. $f(n) = 9n^2 - 2$
- ___ 29. Find a recursive function rule for the sequence $9, -18, 36, -72, 144, \dots$
a. $f(1) = 9; f(n) = 9(-2)^n$
b. $f(1) = 9; f(n) = 2[f(n-1)]^{-1}$
c. $f(1) = 9; f(n) = (-2)^n f(n)$
d. $f(1) = 9; f(n) = -2f(n-1)$

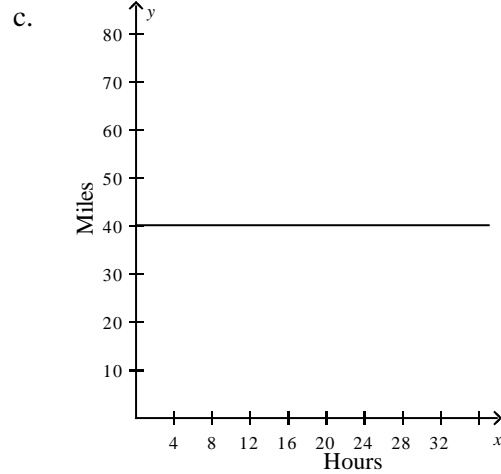
30. The function $y = 40x$ describes how far from home Shu Ling is as she drives from Dallas to Miami. Graph the function. Use the graph to estimate how far from home Shu Ling is in 12 hours.



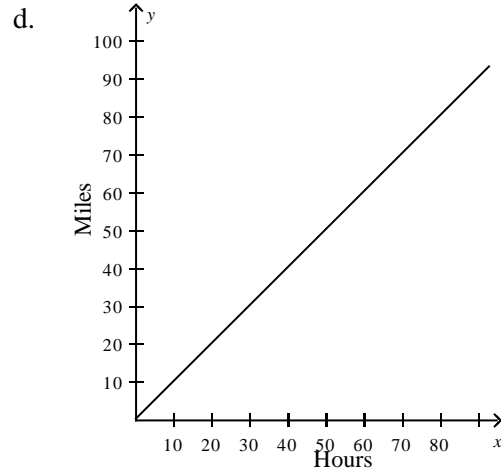
Shu Ling is about 480 miles from home in 12 hours.



Shu Ling is about 52 miles from home in 12 hours.



Shu Ling is about 40 miles from home in 12 hours.



Shu Ling is about 12 miles from home in 12 hours.

31. Which function below generates the sequence $-2, 0, 2, 4, 6, \dots$?

- a. $f(n) = n - 2$, where $n \geq 0$ and n is an integer.
- b. $f(n) = 2n - 2$, where $n \geq 0$ and n is an integer.
- c. $f(n) = -2n + 2$, where $n \geq 1$ and n is an integer.
- d. $f(n) = 2n$, where $n \geq 0$ and n is an integer.

32. A pipe is leaking at the rate of 8 fluid ounces per minute. Use dimensional analysis to find out how many gallons the pipe is leaking per hour.

- a. 3,840 gal/h
- b. 0.02 gal/h
- c. 3.75 gal/h
- d. 17.07 gal/h

- _____ 33. Molly jogged at a rate of 6 miles per hour. What was her speed in feet per second?
- 8.8 ft/s
 - 14.7 ft/s
 - 176 ft/s
 - 528 ft/s

Multiple Response

Identify one or more choices that best complete the statement or answer the question.

- _____ 1. To print custom-designed T-shirts, Maria must pay a \$45 fee plus \$15 for each T-shirt. What equations could be used to find the number t of T-shirts Maria could print with \$390?
- $45t = 390$
 - $15t + 45 = 390$
 - $45t + 15 = 390$
 - $15t = 390$
 - $15t = 390 - 45$
- _____ 2. The domain of the function $f(x)$ is the set of integers greater than -5 . Which of the following values represent elements of the range of f ?
- | | |
|-------------|--------------------------------|
| a. $f(4.8)$ | e. $f\left(\frac{1}{2}\right)$ |
| b. $f(-2)$ | f. $f(0)$ |
| c. $f(-5)$ | g. $f(14)$ |
| d. $f(8)$ | h. $f(-18)$ |
- _____ 3. Which values are in the domain of the function $f(x) = -6x + 11$ with a range $\{-37, -25, -13, -1\}$?
- 1
 - 2
 - 3
 - 4
 - 5
 - 6
 - 7
 - 8

Short Answer

1. Classify the following numbers as Rational or Irrational:

- a) $\sqrt{3}$ b) 3.66666... c) $\sqrt{16}$ d) -15 e) π

2. Determine whether each one of the following is rational or irrational:

- | | |
|------------------------------------|---|
| a) The Product of $\sqrt{2}$ and 5 | b) The Sum of $\sqrt{10}$ and $\sqrt{16}$ |
| c) The Sum of $\sqrt{4}$ and 4 | c) The Product of $\sqrt{2}$ and $\sqrt{2}$ |

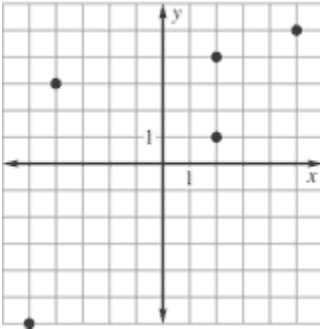
3. Troy went on a two-hour bike ride, completing a round trip of 13 kilometers. When he returned, he claimed his average speed for the trip was $\frac{13 \text{ km}}{2 \text{ hr}} \cdot \frac{3600 \text{ sec}}{1 \text{ hr}} \cdot \frac{1 \text{ km}}{1000 \text{ m}} = 23.4$ meters per second. Use the units in Troy's expression to explain why his calculation is incorrect. Then rewrite the expression and find the correct average speed to the nearest tenth of a meter per second.

4. The approximate number of Calories C that an animal needs each day is given by $C = 72m^{\frac{3}{4}}$, where m is the animal's mass in kilograms. Find the number of Calories that a Siberian tiger of mass 256 Kilograms needs daily.

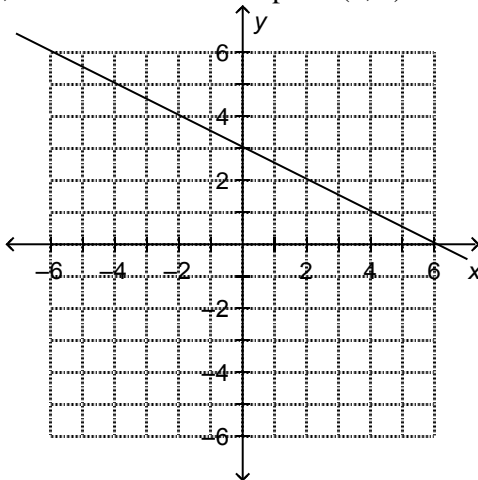
5. Tell whether the pairing is a function.

Input	Output
5	10
10	15
10	20
20	25

6. Identify the domain and range. Then tell whether the relation is a function.



7. The graph of $y = -\frac{1}{2}x + 3$ is shown below. Use the graph to find the y -values associated with $x = -2$, $x = 0$, and $x = 2$. Tell if the point $(2, 1)$ is a solution of the function?

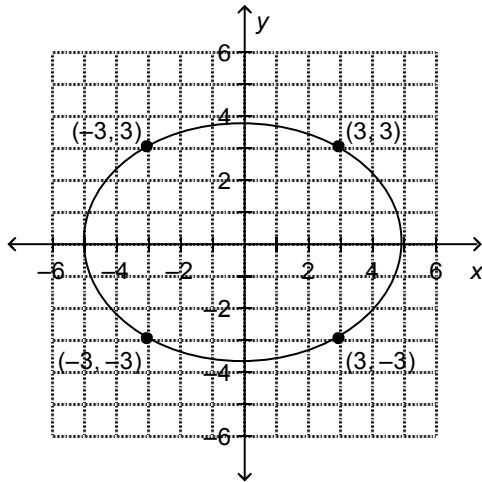


8. If $f(x) = 45x - 40$ and $g(x) = 85x - 110$, find the value of x for which $f(x) = g(x)$?

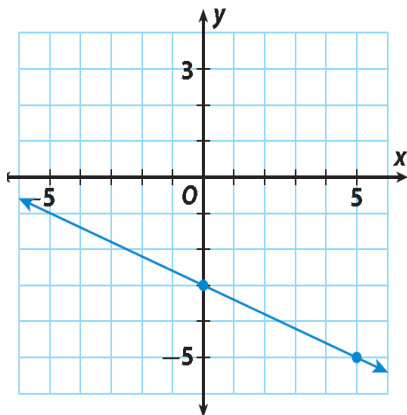
9. A certain vine grows at a rate of three inches per day. A researcher starts observing it when it is 27 inches long.
- Write an algebraic expression for the length, in feet, of the vine d days after the researcher starts observing it.
 - Interpret both of the factors in the term with a coefficient.
 - Interpret the term with a coefficient.
10. Write an explicit rule for the given recursive formula.

$$f(1) = -3 ; f(n) = f(n - 1) + 4$$

11. Determine whether the following graph represents y as a function of x . If it does, explain why and estimate the domain and range. If it does not, explain why, describe a portion of the graph that could be removed to turn it into a function, and estimate the domain and range of the result.



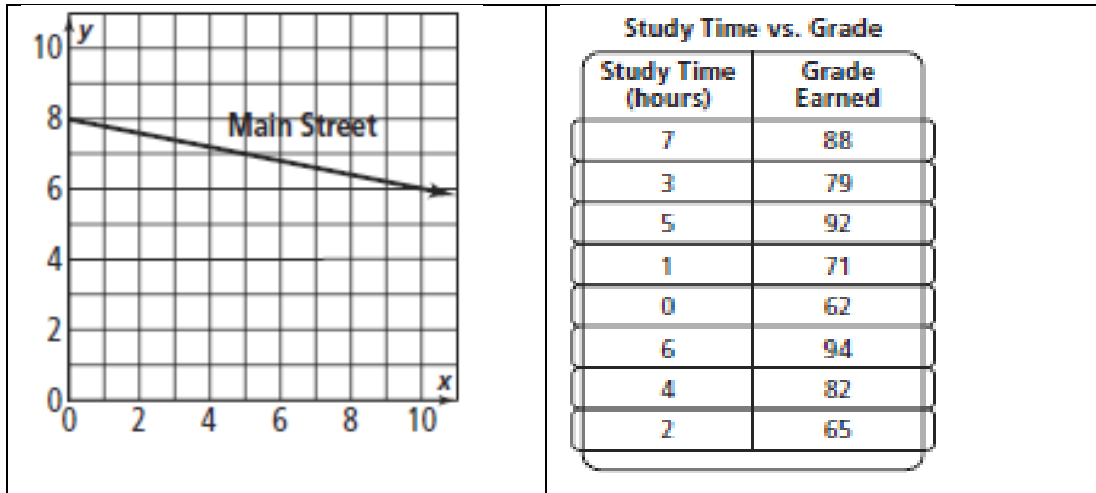
12. Find the Slope and the y - intercept of the following graph.



13. Complete the table for the given two functions. Then compare the features of the two functions.

$f(x)$

$g(x)$



Features	$f(x)$	$g(x)$
Domain		
Range		
Initial Value of the function		
Final Value of the function		
Slope		

Write a comparison statement for each feature of the two functions.

14. In 1992, the cost for sending 1 ounce letter was 25 cents. The price kept changing over the years and the following table describes the relationship between the cost of postage and the year (x). Find the rate of change of cost over the given time period and interpret its meaning.

Year (x)	1992	1996	2000	2004	2008
Cost in Cents (y)	25	30	35	40	45