

TEST #1 IN CLASS REVIEW

Evaluate the expression.

1. $18 - (a - b)^2$, for $a = 2$ and $b = 4$

$$18 - (2 - 4)^2$$

Use mathematical symbols to translate the phrase. Use x to represent the unknown number. If there are two unknown numbers, use x and y to represent the numbers.

2. 13 more than half of some number

Let the number be x
 $\rightarrow \frac{1}{2}x + 13$

Find the absolute value.

3. $|-3.72|$

Subtract.

4. $\frac{1}{10} - \left(-\frac{1}{5}\right)$

$$\frac{1}{10} + \frac{1}{5} = \frac{1+2}{10} = \frac{3}{10}$$

Divide.

5. $-\frac{8}{9} \div \frac{1}{5}$

$$-\frac{8}{9} \times \frac{5}{1} = -\frac{40}{9}$$

Calculate using the rules for order of operations.

6. $9 - (10 - 2 \cdot 10^2)$

$$\begin{aligned} 9 - (10 - 2 \cdot 100) &= 9 - (10 - 200) \\ &= 9 - (-190) = 9 + 190 = 199 \end{aligned}$$

Simplify by using the distributive law and combining like terms.

7. $4(3m + 5) - 5(4m - 3)$

$$\begin{aligned} 12m + 20 - 20m + 15 \\ = -8m + 35 \end{aligned}$$

Solve the equation.

8. $7x - 8 + 2x = 9x + 1 - 3x$

$$\begin{aligned} 9x - 8 &= 6x + 1 \Rightarrow 9x - 6x - 8 = 1 \Rightarrow 9x - 6x = 8 + 1 \\ \Rightarrow 3x &= 9 \Rightarrow x = \frac{9}{3} \Rightarrow x = 3 \end{aligned}$$

Translate the situation into mathematical language. You need not actually solve the problem.

9. Dan's scores on five tests are 80, 91, 93, 90, and 78. What must the score on his next test be so that the average will be 79?

$$\begin{aligned} \text{let the score on his next test be } x \\ \frac{80 + 91 + 93 + 90 + 78 + x}{6} = 79 \end{aligned}$$

Solve the problem.

10. A baseball team played 164 complete games last season. They had 26 fewer wins than losses. How many games did the team win?

let the # games won be x .

$$\# \text{ losses} - 26 = x \Rightarrow \# \text{ losses} = x + 26$$

$$\# \text{ wins} + \# \text{ losses} = 164$$

$$x + x + 26 = 164 \Rightarrow 2x + 26 = 164$$

$$\begin{aligned} \Rightarrow 2x &= 164 - 26 = 138 \\ \Rightarrow x &= \frac{138}{2} = 69 \end{aligned}$$

Solve.

11. $w = \frac{y-x}{z}$, for x

$$\Rightarrow \underset{+x}{wz} = \underset{+x}{y-x} \Rightarrow \underset{-wz}{wz+x} = \underset{-wz}{y} \Rightarrow x = y - wz$$

Simplify. Write the answer using positive exponents only. Leave the answer in exponential notation.

12. $\left(\frac{2x^3y^{-3}}{x^{-5}y^3} \right)^{-4}$

$$\left(2 \frac{x^3}{x^{-5}} \cdot \frac{y^{-3}}{y^3} \right)^{-4}$$

$$= \left(2 x^{3-(-5)} y^{-3-3} \right)^{-4} = \left(2 x^8 y^{-6} \right)^{-4} = (2)^{-4} (x^8)^{-4} (y^{-6})^{-4} \\ = 2^{-4} x^{-32} y^{24}$$

Simplify. Write the answer using only positive exponents. Leave the answer in exponential notation.

13. $(3x^3)^3$

$$= (3)^3 (x^3)^3$$

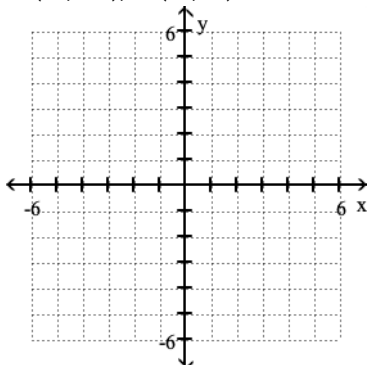
$$= 3^3 x^9 = 27x^9$$

$$= \frac{y^{24}}{2^4 x^{32}}$$

$$= \frac{y^{24}}{16x^{32}}$$

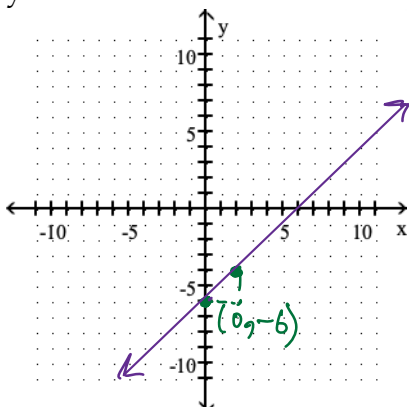
Plot the points with the given coordinates.

14. A(-4, -2), B(-6, 1)



Graph.

15. $y = x - 6$



$m = 1$

y-int = $(0, -6)$

For the given correspondence, write the domain and the range. Then determine whether the correspondence is a function.

16. $\{(-9, -3), (-3, -10), (3, 5), (6, -1)\}$

$-9 \rightarrow -3$

$-3 \rightarrow -10$

$3 \rightarrow 5$

$6 \rightarrow -1$

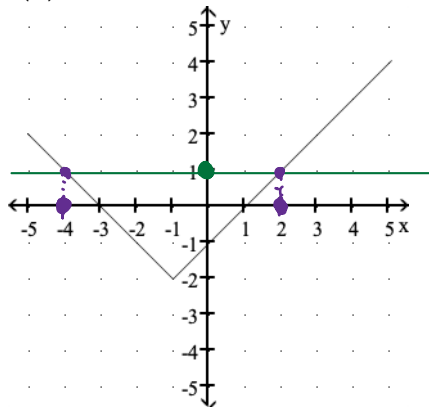
It is a function.

Domain = $\{-9, -3, 3, 6\}$

Range = $\{-3, -10, 5, -1\}$

A function of x is depicted in the graph. Find any input values that produce the indicated output.

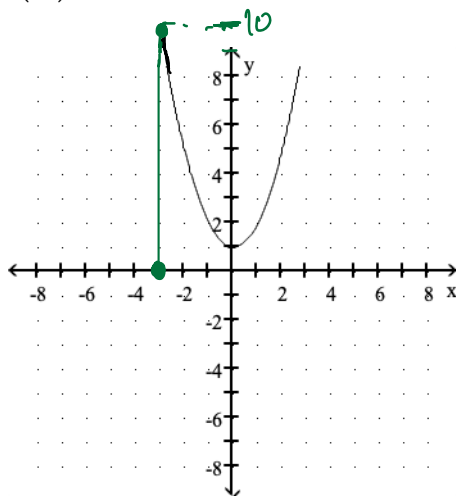
17. $f(x) = 1$



$\Rightarrow$ The corresponding input values are -4 and 2 .

The graph of a function f is provided. Determine the requested function value.

18. $f(-3)$



$f(-3) = 10$

Find the domain of $f(x)$.

19. $f(x) = \frac{6}{x-5}$

$$x-5 = 0 \Rightarrow x = 5$$

$$\text{Domain} = \text{All real numbers except } 5 \\ = \{x : x \neq 5\}$$

20. $f(x) = \sqrt{8-x}$

$$8-x = 0 \Rightarrow x = 8$$

⊛ we cannot have negative numbers inside a square root.

$$x \text{ cannot be larger than } 8 \Rightarrow x \leq 8$$

Find the slope of the line containing the two given points.

21. (6, 9) and (8, 3)

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$\text{Domain} = \{x : x \leq 8\} \\ \text{or All real numbers less than or equal to } 8$$

22. (1, -9) and (1, 5)

$$m = \frac{5 - (-9)}{1 - 1} = \frac{14}{0} = \text{undefined}$$

23. (-9, 1) and (3, 1)

$$m = \frac{1 - 1}{3 - (-9)} = \frac{0}{12} = 0$$

Determine the slope and the y-intercept.

$$24. y = \frac{11}{2}x - 5.4$$

$$m = \frac{11}{2} \quad y\text{-int.} = (0, -5.4)$$

Solve the problem.

25. A deep sea diving bell is being lowered at a constant rate. After 11 minutes, the bell is at a depth of 300 feet. After 50 minutes the bell is at a depth of 2000 feet. What is the average rate of lowering per minute? Round to the nearest tenth if necessary.

$$\begin{aligned} 11 \text{ min.} &\rightarrow 300 \text{ feet } (t_1, d_1) \\ 50 \text{ min.} &\rightarrow 2000 \text{ feet } (t_2, d_2) \end{aligned}$$

$$m = \frac{2000 - 300}{50 - 11} \text{ feet/min.}$$

$$= \frac{1700}{39} \text{ feet/min.}$$

$$= 43.6 \text{ feet/min.}$$

Determine whether the pair of lines is parallel, perpendicular, or neither.

$$26. \begin{aligned} 3x - 2y &= -1 \\ 2x + 3y &= -1 \end{aligned}$$

$$\rightarrow -2y = -3x - 1$$

$$\rightarrow 3y = -2x - 1$$

$$\Rightarrow y = -\frac{2}{3}x - \frac{1}{3}$$

$$\Rightarrow m_2 = -\frac{2}{3}$$

$$\Rightarrow y = \frac{-3}{-2}x - \frac{1}{-2} \Rightarrow y = \frac{3}{2}x + \frac{1}{2}$$

$$\Rightarrow m_1 = \frac{3}{2}$$

$$m_1 m_2 = \frac{3}{2} \cdot -\frac{2}{3} = -1$$

$\Rightarrow$ Perpendicular.

$$27. \begin{aligned} 3x - 8y &= 20 \\ 32x + 12y &= 20 \end{aligned}$$

$$\rightarrow -8y = -3x + 20$$

$$\Rightarrow y = \frac{-3}{-8}x + \frac{20}{-8}$$

$$\Rightarrow m_1 = \frac{3}{8}$$

$$\rightarrow 12y = -32x + 20$$

$$\Rightarrow y = \frac{-32}{12}x + \frac{20}{12}$$

$$\Rightarrow m_2 = -\frac{32}{12} = -\frac{8}{3}$$

$$m_1 m_2 = \frac{3}{8} \cdot -\frac{8}{3} = -1 \Rightarrow \text{Perpendicular}$$

$$28. \begin{aligned} 9x + 3y &= 12 \\ 21x + 7y &= 31 \end{aligned}$$

$$\begin{aligned} m_1 &= -3 \\ m_2 &= -3 \end{aligned}$$

Hw.

$\Rightarrow$ Parallel

Find an equation in point-slope form of the line having the specified slope and containing the point indicated.

29. $m = -2$, $(3, 7)$

$\downarrow$
 x_1 $\rightarrow$ y_1

$$y - y_1 = m(x - x_1)$$

$$y - 7 = -2(x - 3) \Rightarrow y - 7 = -2x + 6 \Rightarrow y = -2x + 13$$

30. $m = \frac{1}{3}$, $(-4, -7)$

Find an equation of the line containing the given pair of points. Write your final answer as a linear function in slope-intercept form.

31. $(-5, 5)$ and $(-9, 21)$

$\downarrow$
 x_1 $\rightarrow$ y_1

$$m = \frac{21 - 5}{-9 - (-5)} = \frac{16}{-9 + 5} = \frac{16}{-4} = -4$$

$$y - 5 = -4(x - (-5)) \Rightarrow y - 5 = -4(x + 5)$$

32. $(-8, 0)$ and $(5, -3)$

$\downarrow$
HW.

$$\Rightarrow y - 5 = -4x - 20$$

$$\Rightarrow y = -4x - 15$$

Solve.

33. Let $f(x) = 6x + 3$ and $g(x) = 9x^2 + 8$. Find $f(3) + g(3)$.

$$f(3) = 6(3) + 3 = 21$$

$$g(3) = 9(3)^2 + 8 = 89$$

$$f(3) + g(3) = 21 + 89 = 110$$

34. Let $f(x) = 4x + 8$ and $g(x) = 4x^2 + 2$. Find $f(9) - g(9)$.

hw

35. Let $f(x) = -9x + 6$ and $g(x) = 9x^2 - 7$. Find $f(7) \cdot g(7)$.

hw

36. Let $f(x) = 9x + 9$ and $g(x) = 3x^2 + 2$. Find $g(3) / f(3)$.

hw

For the pair of functions, find the indicated sum, difference, product, or quotient.

37. $f(x) = 2x - 2$, $g(x) = 9x - 4$

Find $(f - g)(x)$.

$$(f - g)(x) = f(x) - g(x)$$

$$= 2x - 2 - (9x - 4) = 2x - 2 - 9x + 4$$

$$= -7x + 2$$

38. Find $(f - g)(-3)$ when $f(x) = -2x^2 - 3$ and $g(x) = x + 1$.

$$\rightarrow (f - g)(-3) = f(-3) - g(-3)$$

$$f(-3) = \checkmark$$

$$g(-3) = \checkmark$$

39. $f(x) = 2 - 3x$, $g(x) = -5x + 3$
Find $(f + g)(x)$.

hw

40. $f(x) = 4 - 4x$, $g(x) = -9x^2 + 4$
Find $(f + g)(x)$.

hw.

41. $f(x) = 3x^2 - 8x$, $g(x) = x^2 - 5x - 24$
Find $(f/g)(x)$.

hw

42. $f(x) = 4x - 1$, $g(x) = 6x + 8$
Find $(f \cdot g)(x)$.

hw

Answer Key

Testname: TEST #1 IN CLASS REVIEW AND ANSWERS

1. 14

2. $\frac{x}{2} + 13$

3. 3.72

4. $\frac{3}{10}$

5. $-\frac{40}{9}$

6. 199

7. $-8m + 35$

8. 3

9. Let p be the score on the next test; $\frac{80 + 91 + 93 + 90 + 78 + p}{6} = 79$

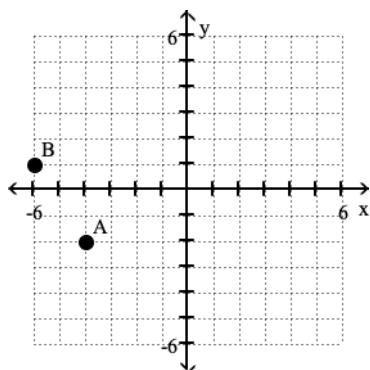
10. 69 games

11. $x = y - wz$

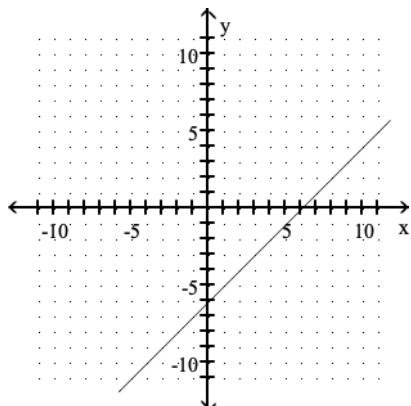
12. $\frac{y^{24}}{16x^{32}}$

13. $27x^9$

14.



15.



Answer Key

Testname: TEST #1 IN CLASS REVIEW AND ANSWERS

16. domain: $\{-9, -3, 3, 6\}$, range: $\{-10, -3, -1, 5\}$; Yes, it is a function.

17. $x = -4$ and $x = 2$

18. 10

19. $\{x \mid x \text{ is a real number and } x \neq 5\}$

20. $\{x \mid x \leq 8\}$

21. - 3

22. Undefined

23. 0

24. Slope = $\frac{11}{2}$; y-intercept = (0, -5.4)

25. 43.6 ft per minute

26. perpendicular

27. perpendicular

28. parallel

29. $y - 7 = -2(x - 3)$

30. $y + 7 = \frac{1}{3}(x + 4)$

31. $f(x) = -4x - 15$

32. $f(x) = -\frac{3}{13}x - \frac{24}{13}$

33. 110

34. -282

35. -24,738

36. $\frac{29}{36}$

37. $-7x + 2$

38. -19

39. $-8x + 5$

40. $-9x^2 - 4x + 8$

41. $\frac{3x^2 - 8x}{x^2 - 5x - 24}$

42. $24x^2 + 26x - 8$