04-03-19
04-05-19

Student: _____ **Instructor:** Alfredo Alvarez **Assignment:** MATHSANANTFIESTAHS145QMR
Date: _____ **Course:** Math 0410 / 0320 Alvarez

1. Solve and check the solution.

$3(5x - 4) = 16x$

$x =$ [ ]

Answer: -12

$15x - 12 = 16x$
$15x - 15x + 12 = 16x - 15x + 12$
$1x = 16x + 12$
$15x - 16x = 16x + 12 - 16x$
$-1x = 12$
$\frac{-1x}{-1} = \frac{12}{-1}$
$x = -12$

2. Solve the equation.

$-2y - 12 = 5y + 9$

$y =$ [ ]

Answer: -3

$-2y - 12 + 12 = 5y + 9 + 12$
$-2y = 5y + 21$
$-2y - 5y = 5y + 21 - 5y$
$-7y = 21$
$\frac{-7y}{-7} = \frac{21}{-7}$
$y = -3$

3. Solve the equation.

$\frac{m}{6} = \frac{m}{18} + \frac{8}{3}$

$m =$ [ ] (Type an integer or a fraction. Simplify your answer.)

Answer: 24

$\frac{m}{6}(18) = \frac{m}{18}(18) + \frac{8}{3}(18)$
$m(3) = m(1) + 8(6)$
$3m = 1m + 48$
$3m - 1m = 1m + 48 - 1m$
$2m = 48$
$\frac{2m}{2} = \frac{48}{2}$
$m = 24$

4. Solve the following equation.

$-3.6x + 1.1 = -16.9$

The solution is [ ]. (Type an integer or a decimal.)

Answer: 5

$-3.6x + 1.1 - 1.1 = -16.9 - 1.1$
$-3.6x = -18$
$\frac{-3.6x}{-3.6} = \frac{-18}{-3.6}$
$x = 5$

5. Solve.

$3(2x - 2.6) = 2x - 7.8$

$x =$ [ ] (Type an integer or a decimal.)

Answer: 0

$6x - 7.8 = 2x - 7.8$
$6x - 7.8 + 7.8 = 2x - 7.8 + 7.8$
$6x = 2x$
$6x - 2x = 2x - 2x$
$4x = 0$
$\frac{4x}{4} = \frac{0}{4}$
$x = 0$

6. Find the total amount in the compound interest account.

$2710 is compounded annually at a rate of 10% for 1 year.

$_____ (Round to the nearest cent.)

Answer: 2981.00

$A = P(1 + \frac{r}{n})^{nt}$

$A = 2710(1 + \frac{.10}{1})^{1(1)}$

$A = 2710(1 + .10)^{1}$

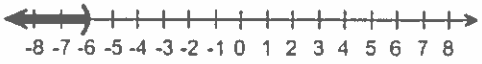
$A = 2710(1.10)^{1}$

$A = 2981.00$

7. Solve the inequality. Graph the solution set and write it in interval notation.

$2x < -12$

Choose the correct graph below.

○ A. 

○ B. 

○ C. 

○ D. 

○ E. 

○ F. 

The solution to the inequality $2x < -12$ is _____.
(Type your answer in interval notation.)

$2x < -12$

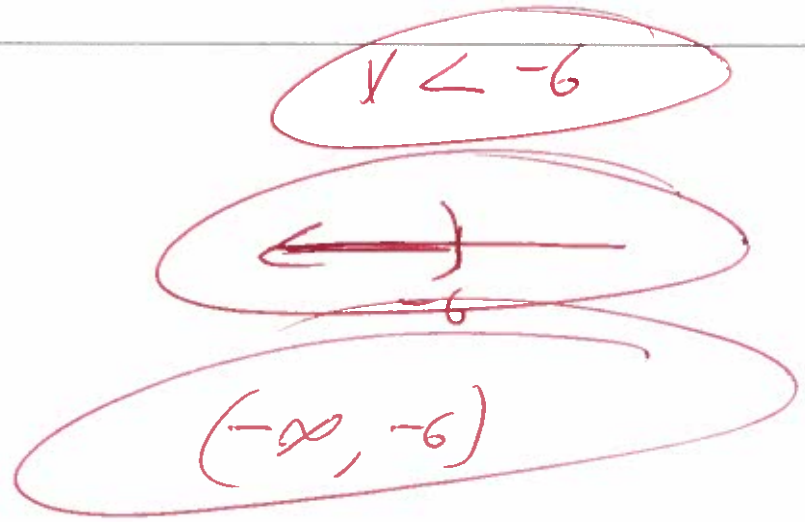
$\frac{2x}{2} < \frac{-12}{2}$

$x < -6$

Answers

A. 

$(-\infty, -6)$



$(-\infty, -6)$

8. Solve the inequality. Graph the solution set and write it in interval notation.

$-7x \leq 28$

Choose the correct graph below.

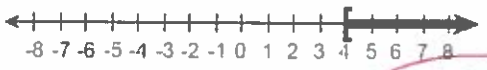
A. 

B. 

C. 

D. 

E. 

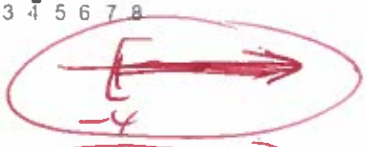
F. 

The solution to the inequality $-7x \leq 28$ is [ ].
(Type your answer in interval notation.)

$-7x \leq 28$

$\frac{-7x}{-7} \geq \frac{28}{-7}$

$x \geq -4$



$[-4, \infty)$

divide by a negative
turn all signs around

Answers

C. 

$[-4, \infty)$

9. Solve the inequality. Graph the solution set and write it in interval notation.

$-0.6y < -3$

$-0.6y < -3$

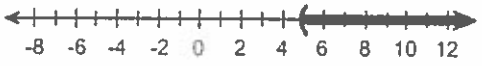
$\frac{-0.6y}{-0.6} > \frac{-3}{-0.6}$

Choose the correct graph below.

A. 

B. 

$x > 5$

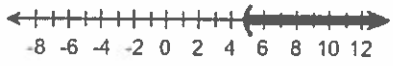
C. 

D. 

The solution set in interval notation is [ ].

$(5, \infty)$

Answers

C. 

$(5, \infty)$

divide by a negative
turn all signs around

10. Solve the inequality.

$4x - 3 < 9x + 22$

$4x - 3 + 3 < 9x + 22 + 3$

$4x < 9x + 25$

$4x - 9x < 9x + 25 - 9x$

$-5x < 25$

$\frac{-5x}{-5} > \frac{25}{-5}$

$x > -5$

$(-5, \infty)$

divide by a negative
turn all signs around

The solution set is [ ]. (Type your answer in interval notation.)

Answer: $(-5, \infty)$

divide by negative flip all signs

11. Solve the inequality.

$-5x + 2 \geq 2(4 - x)$

The solution set is [ ]. (Type your answer in interval notation.)

Answer: $(-\infty, -2]$

$-5x+2 \geq 8-2x$

$-5x+2x-2 \geq 8-2x-2$

$-5x \geq -2x+6$

$-5x+2x \geq -2x+6+2x$

$-3x \geq 6$

$\frac{-3x}{-3} \leq \frac{6}{-3}$

$x \leq -2$

$(-\infty, -2]$

12. Solve the inequality.

$4(3x - 1) \leq 5(2x - 4)$

The solution set is [ ]. (Type your answer in interval notation.)

Answer: $(-\infty, -8]$

$4(3x-1) \leq 5(2x-4)$

$12x-4 \leq 10x-20$

$12x-4+4 \leq 10x-20+4$

$12x \leq 10x-16$

$12x-10x \leq 10x-16-10x$

$2x \leq -16$

$\frac{2x}{2} \leq \frac{-16}{2}$

$x \leq -8$

$(-\infty, -8]$

13.

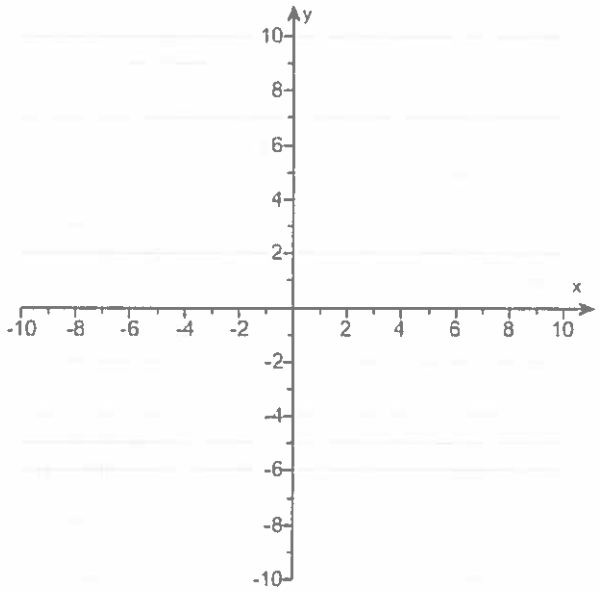
For the following equation, find three ordered pair solutions by completing the table. Then use the ordered pairs to graph the equation.

$y = -7x$

Find three ordered pair solutions of the given equation.

x	y
0	
− 1	
1	

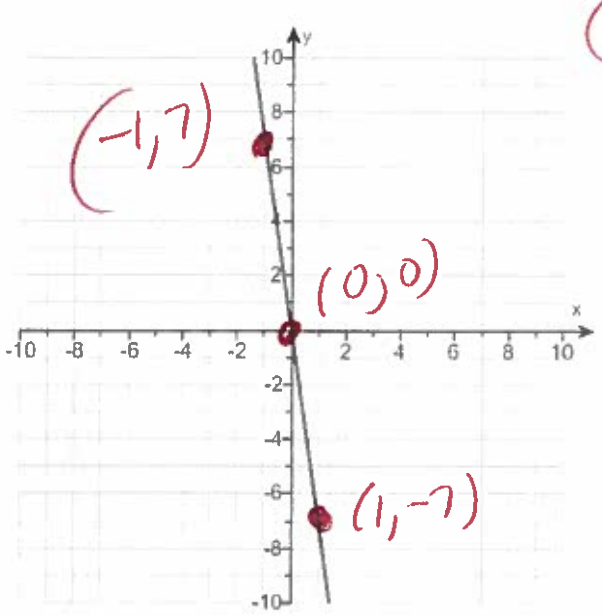
Use the graphing tool to graph the line.



Answers 0

7

−7



$y = -7x$

$y = -7(-1)$

$y = 7$

$y = -7(0)$

$y = 0$

$y = -7(1)$

$y = -7$

x	y
-1	7
0	0
1	-7

14.

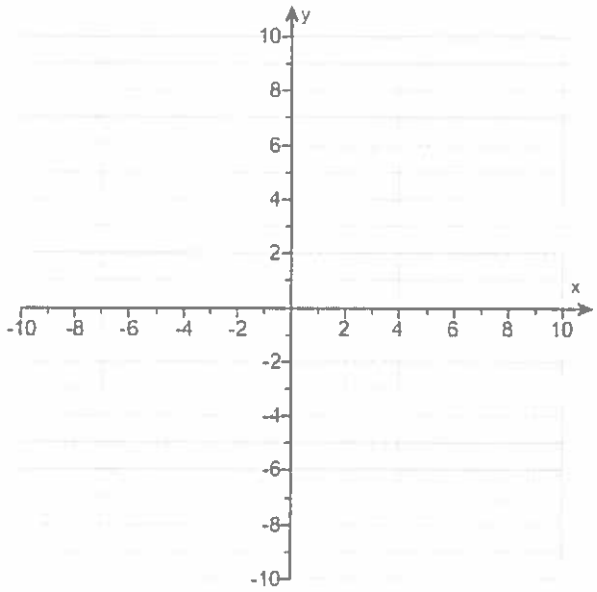
For the equation, find three ordered pair solutions by completing the table. Then use any two of the ordered pairs to graph the equation.

$$y = \frac{1}{4}x$$

Complete the table below.

x	y
0	
4	
−4	

Use the graphing tool to graph the equation.



Answers 0

1

−1

$y = \frac{1}{4}x$

$y = \frac{1}{4}(-4)$

$y = \frac{-4}{4}$

$y = -1$

$y = \frac{1}{4}(0)$

$y = \frac{0}{4}$

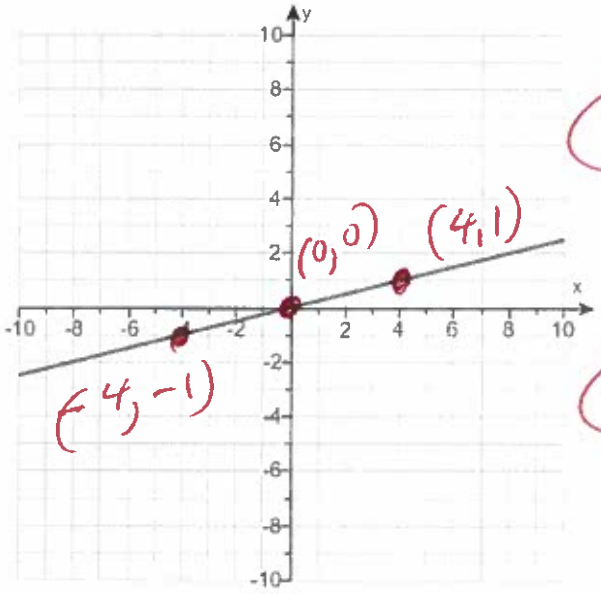
$y = 0$

$y = \frac{1}{4}(4)$

$y = \frac{4}{4}$

$y = 1$

x	y
−4	−1
0	0
4	1



15.

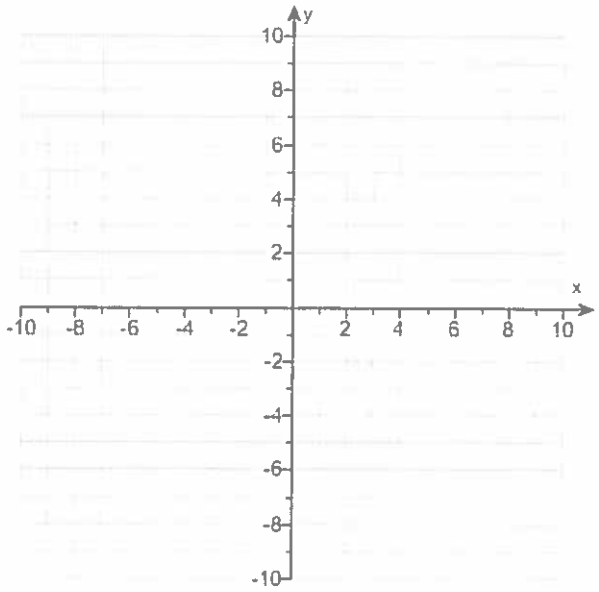
For the following equation, find three ordered pair solutions by completing the table. Then use the ordered pairs to graph the equation.

$y = -2x + 7$

Find three ordered pair solutions of the given equation.

x	y
0	
1	
2	

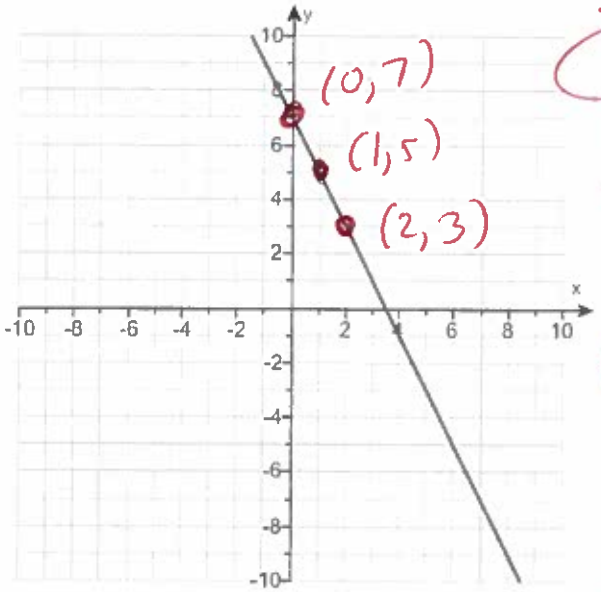
Use the graphing tool to graph the line.



Answers 7

5

3



$y = -2x + 7$

$y = -2(0) + 7$

$y = 0 + 7$

$y = 7$

$y = -2(1) + 7$

$y = -2 + 7$

$y = 5$

$y = -2(2) + 7$

$y = -4 + 7$

$y = 3$

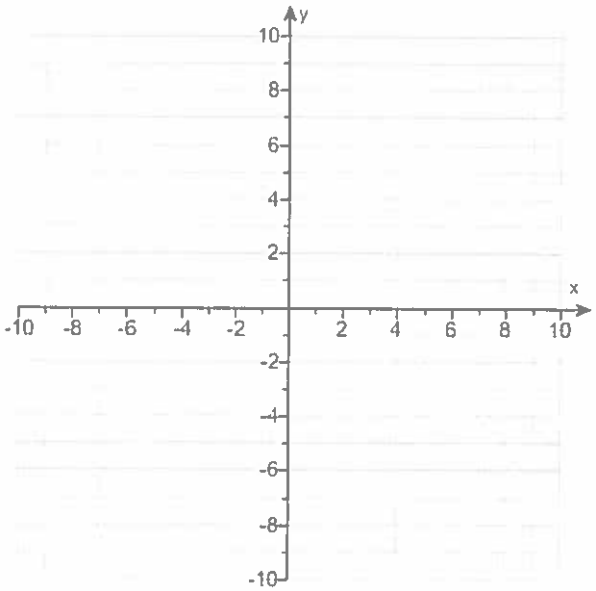
x	y
0	7
1	5
2	3

16.

Graph the linear equation.

$x + 3y = -6$

Use the graphing tool to graph the equation.



$x + 3y - x = -6 - x$

$3y = -6 - x$

$\frac{3y}{3} = \frac{-6}{3} - \frac{1x}{3}$

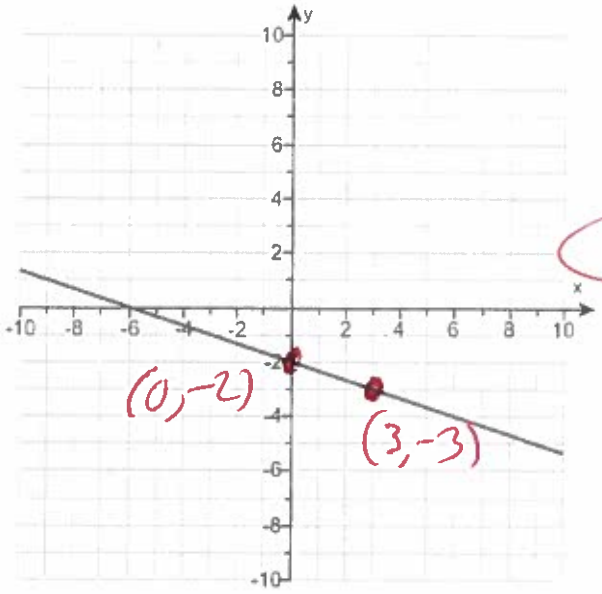
$y = -2 - \frac{1}{3}x$

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

Solve for y

form $y = mx + b$

Answer:



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

$y = -\frac{1}{3}(0) - 2$

$y = 0 - 2$

$y = -2$

$y = -\frac{1}{3}(3) - 2$

$y = -1 - 2$

$y = -3$

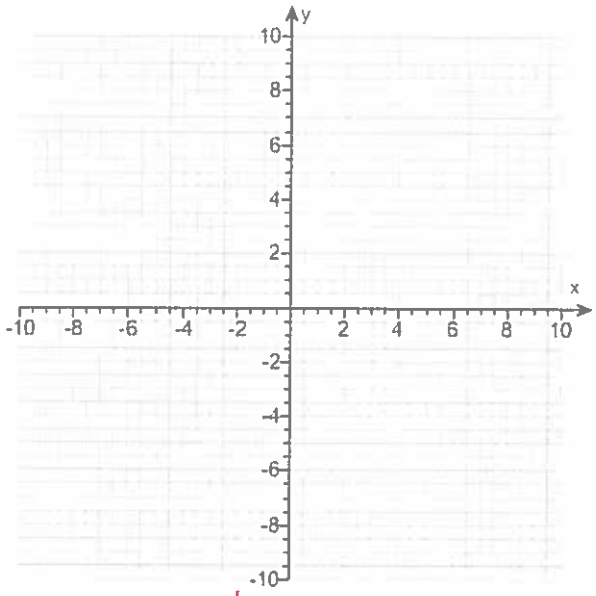
x	y
0	-2
3	-3

17.

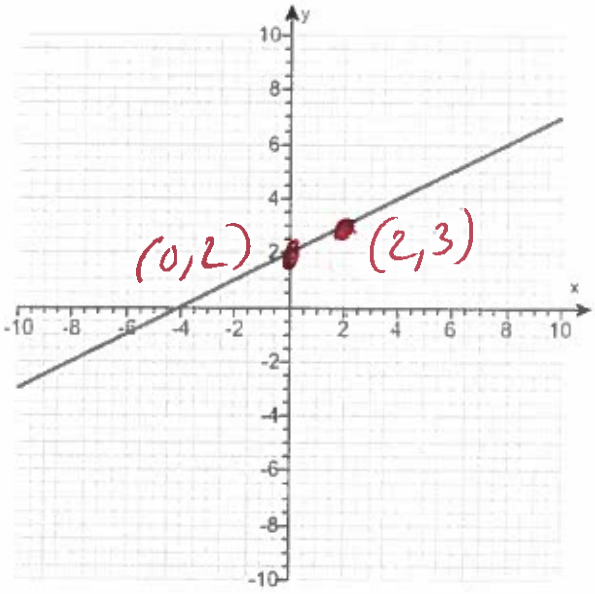
Graph the linear equation.

$$y = \frac{1}{2}x + 2$$

Use the graphing tool to graph the linear equation.



Answer:



$y = \frac{1}{2}x + 2$

$y = \frac{1}{2}(0) + 2$

$y = 0 + 2$

$y = 2$

$y = \frac{1}{2}(2) + 2$

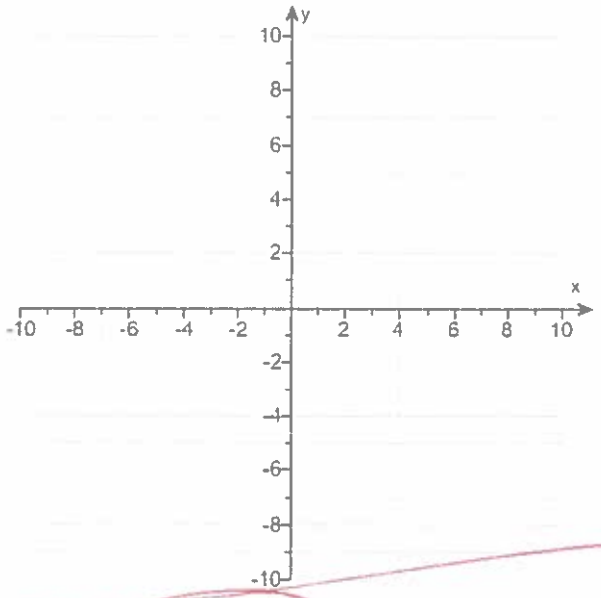
$y = 1 + 2$

$y = 3$

x	y
0	2
2	3

18.

Graph the linear equations y = 3x and y = 3x + 3 on the same set of axes. Discuss how the graphs are similar and how they are different.

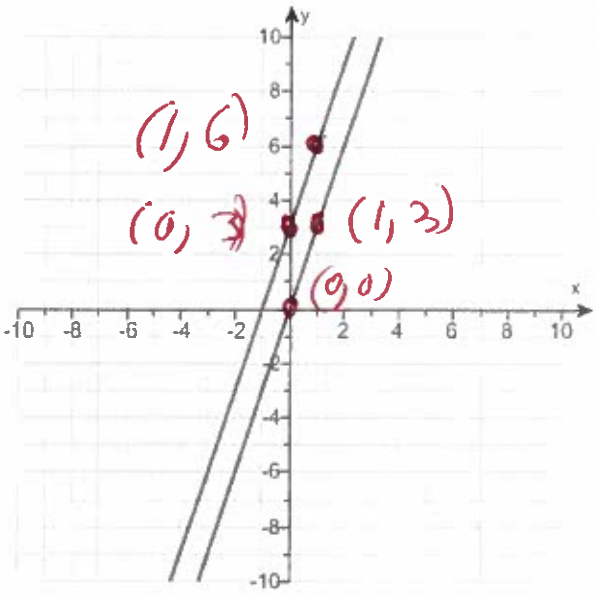


Use the graphing tool to graph the linear equations.

How are the graphs similar and how are they different?

- ○ **A.** Both graphs have the same tilt, but they cross the y-axis at different points.
- ○ **B.** Both graphs have the same tilt, and they cross the y-axis at the same point.
- ○ **C.** Both graphs have different tilts, but they cross the y-axis at the same point.
- ○ **D.** Both graphs have different tilts, and they cross the y-axis at different points.

Answers



$y = 3x$

$y = 3(0)$

$y = 0$

$y = 3(1)$

$y = 3$

x	y
0	0
1	3

$y = 3x + 3$

$y = 3(0) + 3$

$y = 0 + 3$

$y = 3$

x	y
0	3
1	6

A. Both graphs have the same tilt, but they cross the y-axis at different points.

Parallel lines never intersect

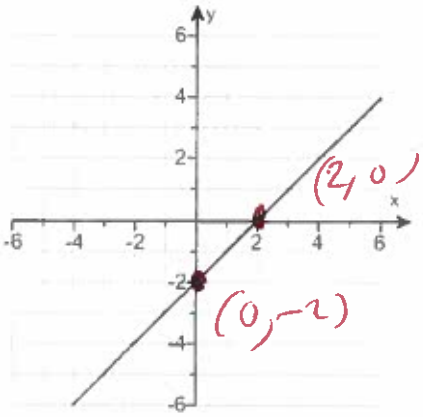
$y = 3(1) + 3$

$y = 3 + 3$

$y = 6$

19.

Identify the intercepts.



Answers (2,0)

(0, − 2)

Identify all the x-intercepts.

(Type an ordered pair. Use a comma to separate answers as needed.)

Identify all the y-intercepts.

(Type an ordered pair. Use a comma to separate answers as needed.)

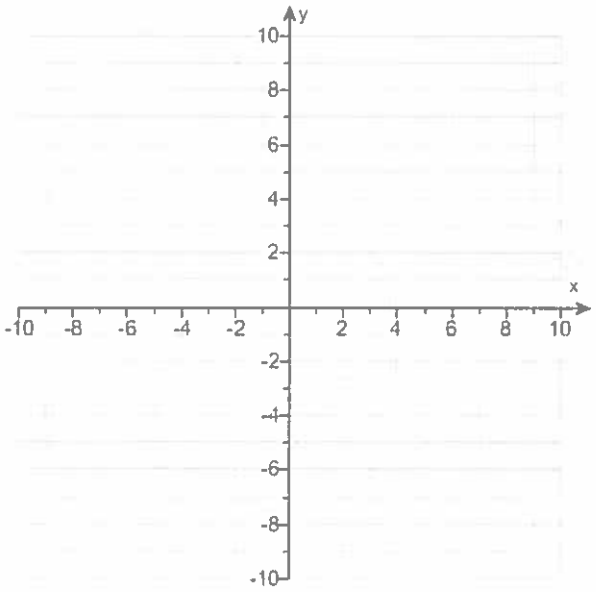
x-intercept = 2 OR (2, 0)
y-intercept = −2 OR (0, −2)

20.

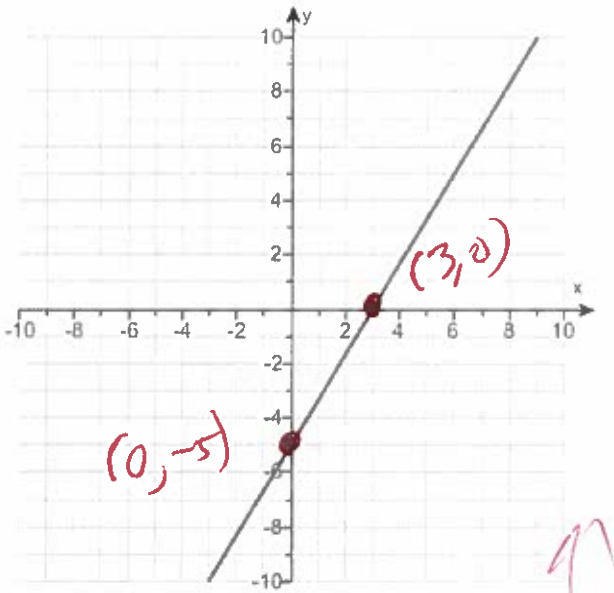
Plot the intercepts to graph the equation.

$5x - 3y = 15$

Use the graphing tool to graph the equation. Use the intercepts when drawing the line. If only one intercept exists, use it and another point to draw the line.



Answer:



$5x-3y=15$

find x-intercept let $y=0$

$5x-3(0)=15$

$5x-0=15$

$5x=15$

$\frac{5x}{5}=\frac{15}{5}$

$x=3$

(3,0)

$5x-3y=15$

find y-intercept let $x=0$

$5(0)-3y=15$

$0-3y=15$

$-3y=15$

$\frac{-3y}{-3}=\frac{15}{-3}$

$y=-5$

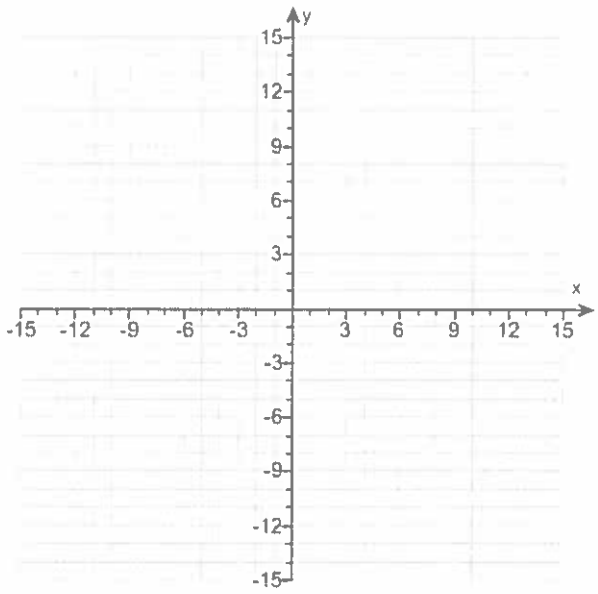
(0,-5)

21.

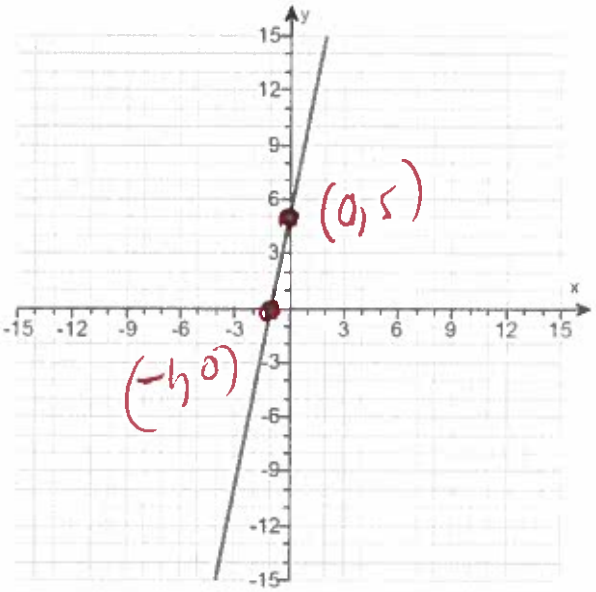
Graph using the x- and y-intercepts.

$y = 5x + 5$

Use the graphing tool to graph the linear equation. Use the intercepts when drawing the line. If only one intercept exists, use it and another point to draw the line.



Answer:



$y = 5x + 5$

Find x-intercept let $y = 0$

$0 = 5x + 5$

$0 - 5 = 5x + 5 - 5$

$-5 = 5x$

$\frac{-5}{5} = \frac{5x}{5}$

$-1 = x$

$(-1, 0)$

$y = 5x + 5$

Find y-intercept let $x = 0$

$y = 5(0) + 5$

$y = 0 + 5$

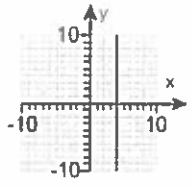
$y = 5$

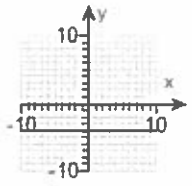
$(0, 5)$

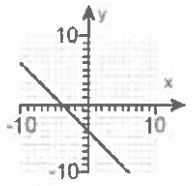
22. Match the equation with its graph.

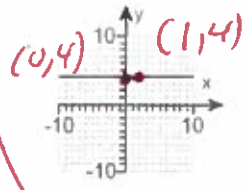
y = 4

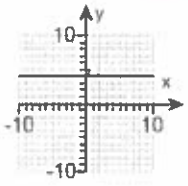
Choose the correct graph below.

A. 

B. 

C. 

D. 

Answer: 

D.

y = 4 always

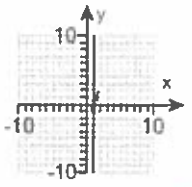
x	y
0	4
1	4

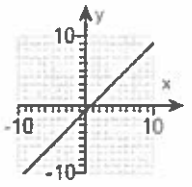
note
domain all real numbers $(-\infty, \infty)$
range $\{4\}$

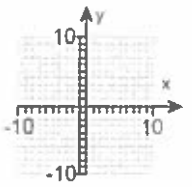
23. Match the equation with its graph.

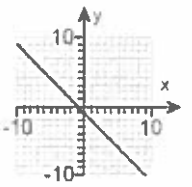
x = 1

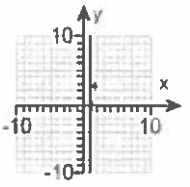
Choose the correct graph below.

A. 

B. 

C. 

D. 

Answer: 

A.

x = 1 always

x	y
1	0
1	1

Note
domain $\{1\}$
range all real numbers $(-\infty, \infty)$

24. Find the slope of the line that goes through the given points.

(−7, 7) and (−5, −5)

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

$m = \frac{(7)-(-5)}{(-7)-(-5)}$

$m = \frac{7+5}{-7+5}$

$m = \frac{12}{-2}$

$m = -6$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The slope is _____. (Type an integer or a simplified fraction.)
- B. The slope is undefined.

Answer: A. The slope is −6. (Type an integer or a simplified fraction.)

25. Find the slope of the line that goes through the given points.

(3, −6) and (3, 5)

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

$m = \frac{(-6)-(5)}{(3)-(3)}$

$m = \frac{-6-5}{3-3}$

$m = \frac{-11}{0}$

Slope is undefined

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The slope is _____. (Type an integer or a fraction. Simplify your answer.)
- B. The slope is undefined.

Answer: B. The slope is undefined.

26. Find the slope of the line that goes through the given points.

(−4, 2) and (9, 1)

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

$m = \frac{(2)-(1)}{(-4)-(9)}$

$m = \frac{2-1}{-4-9}$

$m = \frac{1}{-13}$

or

$m = -\frac{1}{13}$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The slope is _____. (Simplify your answer.)
- B. The slope is undefined.

Answer: A. The slope is $-\frac{1}{13}$. (Simplify your answer.)

27. Find the slope of the line that goes through the given points.

(3,2) and (4,2)

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

$m = \frac{(2)-(2)}{(3)-(4)}$

$m = \frac{2-2}{3-4}$

$m = \frac{0}{-1}$

$m = 0$

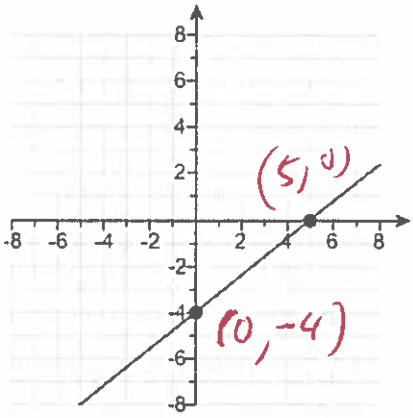
Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The slope is _____. (Type an integer or a simplified fraction.)
- B. The slope is undefined.

Answer: A. The slope is 0. (Type an integer or a simplified fraction.)

28.

Find the slope of the line if it exists.



Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The slope is _____.
(Simplify your answer. Type an integer or a fraction.)

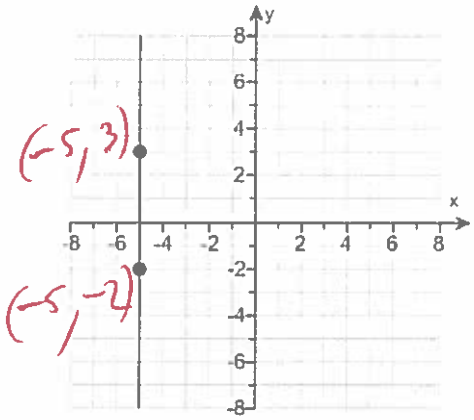
B. The slope is undefined.

$(0,-4)\ (5,0)$
$x_1\ y_1\ x_2\ y_2$
$m = \frac{y_1 - y_2}{x_1 - x_2}$
$m = \frac{(-4)-(0)}{(0)-(5)}$
$m = \frac{-4-0}{0-5}$
$m = \frac{-4}{-5}$
$m = \frac{4}{5}$

Answer: A. The slope is $\frac{4}{5}$.(Simplify your answer. Type an integer or a fraction.)

29.

Find the slope of the line if it exists.



Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The slope is _____.
(Type an integer or a simplified fraction.)

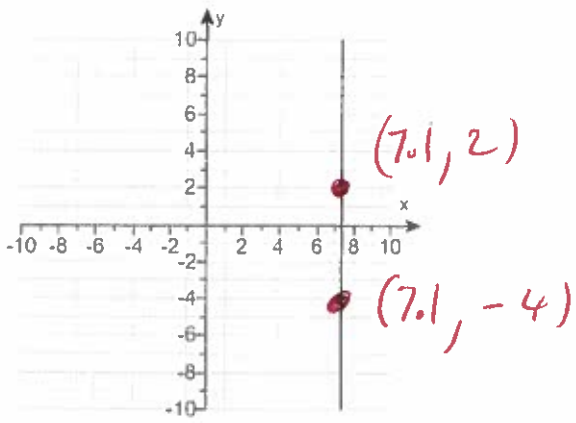
B. The slope is undefined.

$(-5,3)\ (-5,-2)$
$x_1\ y_1\ x_2\ y_2$
$m = \frac{y_1 - y_2}{x_1 - x_2}$
$m = \frac{(3)-(-2)}{(-5)-(-5)}$
$m = \frac{3+2}{-5+5}$
$m = \frac{5}{0}$

Answer: B. The slope is undefined.

Slope is undefined

30. For the graph on the right, determine if the slope is positive, negative, zero, or undefined.



(7.1, 2)

(7.1, -4)

Choose the correct slope.

- A. Negative
- B. Undefined
- C. Positive
- D. Zero

(7.1, 2) (7.1, -4)
x_1 y_1 x_2 y_2

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

$$m = \frac{(2)-(-4)}{(7.1)-(7.1)} = \frac{2+4}{7.1-7.1} = \frac{6}{0} = \text{undefined}$$

Answer: B. Undefined

31. Solve the following equation for y.

$y - 7 = -6(x - (-5))$

y = [ ] (Simplify your answer.)

Answer: $-6x - 23$

$y - 7 = -6(x - (-5))$

$y - 7 = -6(x + 5)$

$y - 7 = -6x - 30$

$y - 7 + 7 = -6x - 30 + 7$

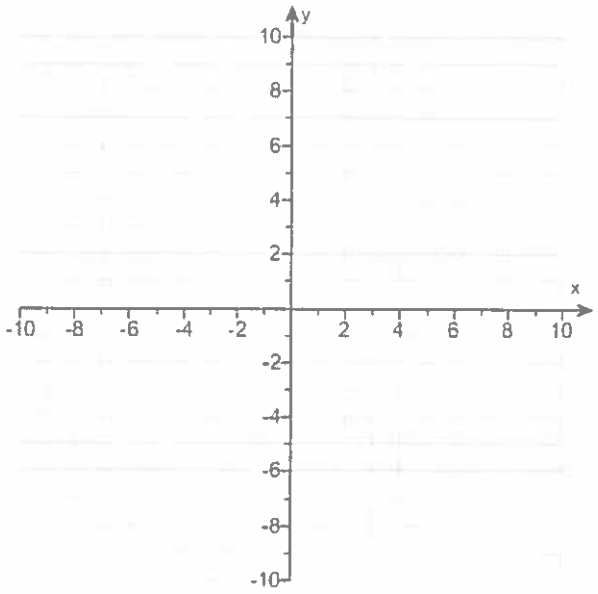
$y = -6x - 23$

Solve for y

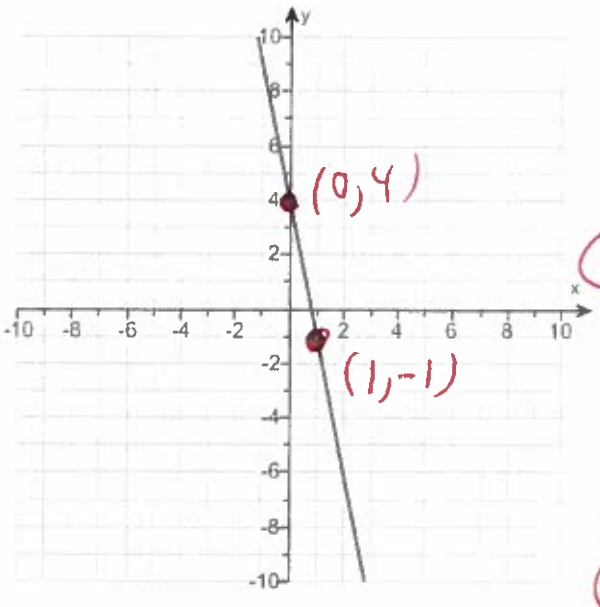
32.

Use the slope-intercept form to graph the equation $y = -5x + 4$.

Use the graphing tool to graph the line. Use the slope and y-intercept when drawing the line.



Answer:



$y = -5x + 4$

$y = -5(0) + 4$

$y = 0 + 4$

$y = 4$

x	y
0	4
1	-1

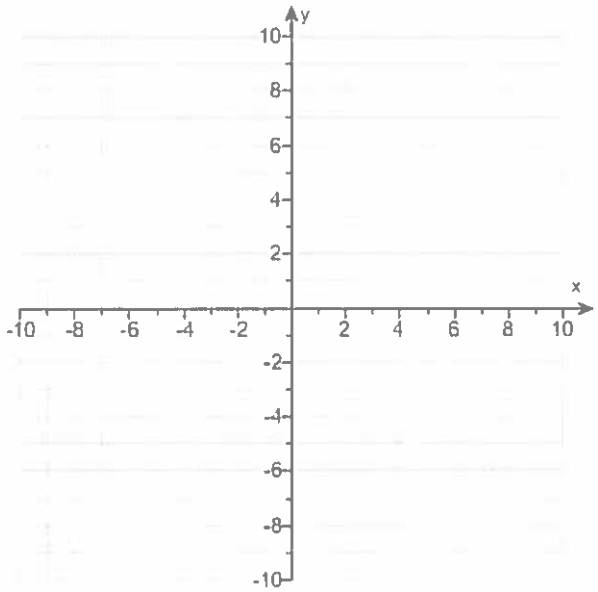
$y = -5(1) + 4$

$y = -5 + 4$

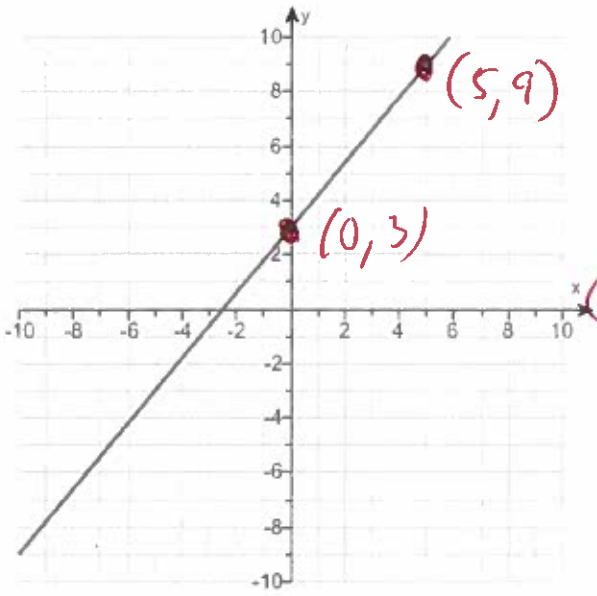
$y = -1$

33. Use the slope-intercept form to graph the equation $y = \frac{6}{5}x + 3$.

Use the graphing tool to graph the line. Use the slope and y-intercept when drawing the line.



Answer:



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

$y = \frac{6}{5}(0) + 3$

$y = 0 + 3$

$y = 3$

$y = \frac{6}{5}(5) + 3$

$y = 6 + 3$

$y = 9$

x	y
0	3
5	9

formula

34. Write an equation of the line with the given slope, m, and y-intercept (0,b).

m = 5, b = 6

$y = mx + b$

$y = 5x + 6$

The equation is ____.

(Simplify your answer. Type your answer in slope-intercept form. Use integers or fractions for any numbers in the equation.)

Answer: y = 5x + 6

35. Find an equation of the line with the given slope that passes through the given point. Write the equation in the form $Ax + By = C$.

$m = -4, (-8, -2)$

The equation of the line in the form $Ax + By = C$ is _____.
(Simplify your answer. Use integers or fractions for any numbers in the equation.)

Answer: $4x + y = -34$

$y - y_1 = m(x - x_1)$ $\quad y - (-2) = -4(x - (-8))$
$y + 2 = -4(x + 8)$
$y + 2 = -4x - 32$
$y + 2 - 2 = -4x - 32 - 2$
$y = -4x - 34$
$4x + y = -34$

36. Find the slope-intercept form of the line whose slope is 6 and that passes through the point $(-4, 7)$.

The equation of the line is _____.
(Type your answer in slope-intercept form.)

Answer: $y = 6x + 31$

$m = 6$
$y - y_1 = m(x - x_1)$
$y - (7) = 6(x - (-4))$
$y - 7 = 6(x + 4)$
$y - 7 = 6x + 24$
$y - 7 + 7 = 6x + 24 + 7$
$y = 6x + 31$

37. Find the slope-intercept equation of the line that has the given characteristics.

Slope -7 and y-intercept $(0, 5)$

The equation is _____.
(Simplify your answer. Type your answer in slope-intercept form. Use integers or fractions for any numbers in the equation.)

Answer: $y = -7x + 5$

$y - y_1 = m(x - x_1)$
$y - (5) = -7(x - (0))$
$y - 5 = -7(x - 0)$
$y - 5 = -7(x)$
$y - 5 = -7x$
$y - 5 + 5 = -7x + 5$
$y = -7x + 5$

38. Find an equation of the line described below. Write the equation in slope-intercept form (solved for y), when possible.

Slope $-\frac{4}{7}$, through $(-3, -2)$

What is the equation of the line?

A. $y = -\frac{4}{7}x + \frac{26}{7}$
B. $y = -\frac{4}{7}x + \frac{12}{7}$
C. $y = -\frac{4}{7}x + 2$
D. $y = -\frac{4}{7}x - \frac{26}{7}$
E. $y = -\frac{4}{7}x - 2$
F. $y = -\frac{4}{7}x - 3$
G. $y = -\frac{4}{7}x - \frac{12}{7}$
H. $y = -\frac{4}{7}x + 3$

Answer: D. $y = -\frac{4}{7}x - \frac{26}{7}$

$y - y_1 = m(x - x_1)$ $\quad y - (-2) = -\frac{4}{7}(x - (-3))$
$y + 2 = -\frac{4}{7}(x + 3)$
$y + 2 = -\frac{4}{7}x - \frac{12}{7}$
$y + 2 - 2 = -\frac{4}{7}x - \frac{12}{7} - 2$
$y = -\frac{4}{7}x - \frac{12}{7} - \frac{2}{7}(\frac{7}{7})$
$y = -\frac{4}{7}x - \frac{12}{7} - \frac{14}{7}$
$y = -\frac{4}{7}x - \frac{12-14}{7}$
$y = -\frac{4}{7}x - \frac{26}{7}$

39. Find the value of $x^2 - 5x + 1$ for the given value of x.

$x = -1$

The value of the polynomial for $x = -1$ is _____. (Simplify your answer.)

Answer: 7

$(-1)^2 - 5(-1) + 1 =$
$(-1)(-1) - 5(-1) + 1 =$
$1 + 5 + 1 =$
$6 + 1 =$
$7 =$

40. Write an equation in standard form of the line that contains the point $(-2,1)$ and is
a. parallel to the line $y = 7x + 1$
b. perpendicular to the line $y = 7x + 1$

a. Which of the following equations, written in standard form, is parallel to the line $y = 7x + 1$ and contains the point $(-2,1)$? Choose the correct answer below.

- A. $7x + y = 15$
- B. $x + y = \frac{3}{7}$
- C. $x - y = -\frac{3}{7}$
- D. $7x - y = -15$

$m = 7$ $(-2,1)$ x_1 y_1
$y - y_1 = m(x - x_1)$
$y - (1) = 7(x - (-2))$
$y - 1 = 7(x + 2)$
$y - 1 = 7x + 14$
$y - 7x = 7x + 14 + 1 - 7x$
$y - 7x = 15$
$-1(y - 7x) = -1(15)$ multiply by -1
$-y + 7x = -15$
$7x - y = -15$

b. Which of the following equations, written in standard form, is perpendicular to the line $y = 7x + 1$ and contains the point $(-2,1)$? Choose the correct answer below.

- A. $x + 7y = 5$
- B. $x + 7y = -1$
- C. $x - 7y = -5$
- D. $x - 7y = 1$

$m = -\frac{1}{7}$ $(-2,1)$ x_1 y_1
$y - y_1 = m(x - x_1)$
$y - (1) = -\frac{1}{7}(x - (-2))$
$y - 1 = -\frac{1}{7}(x + 2)$
$y - 1 = -\frac{1}{7}x - \frac{2}{7}$
$7(y - 1) = 7(-\frac{1}{7}x - \frac{2}{7})$
$7y - 7 = -\frac{7}{7}x - \frac{14}{7}$
$7y - 7 = -1x - 2$
$7y - 7 + 7 = -1x - 2 + 7$
$7y = -1x + 5$
$7y + 1x = -1x + 5 + 1x$
$7y + 1x = 5$
$x + 7y = 5$

Answers D. $7x - y = -15$
A. $x + 7y = 5$

41. Find the domain and the range of the given relation.

$\{(6,-4), (3,-9), (-3,-7), (-7,-3)\}$

The domain is { _____ }. (Use a comma to separate answers as needed.)

The range is { _____ }. (Use a comma to separate answers as needed.)

Answers 6,3,−3,−7
−4,−9,−7,−3

First number in pairs
domain = {6, 3, −3, −7}
range = {−4, −9, −7, −3}
2nd number in pairs

42. Given the following function, find f(− 1), f(0), and f(1).

$f(x) = x^2 - 2$

f(− 1) = ____

f(0) = ____

f(1) = ____

Answers − 1
− 2
− 1

$f(-1) = (-1)^2 - 2$
$f(-1) = (-1)(-1) - 2$
$f(-1) = 1 - 2$
$f(-1) = -1$

$f(0) = (0)^2 - 2$
$f(0) = (0)(0) - 2$
$f(0) = 0 - 2$
$f(0) = -2$

$f(1) = (1)^2 - 2$
$f(1) = (1)(1) - 2$
$f(1) = 1 - 2$
$f(1) = -1$

43. Find h(− 3), h(0), and h(4) for the following function.

$h(x) = 2x^2 - 3$

h(− 3) = ____ (Simplify your answer.)

h(0) = ____ (Simplify your answer.)

h(4) = ____ (Simplify your answer.)

Answers 15
− 3
29

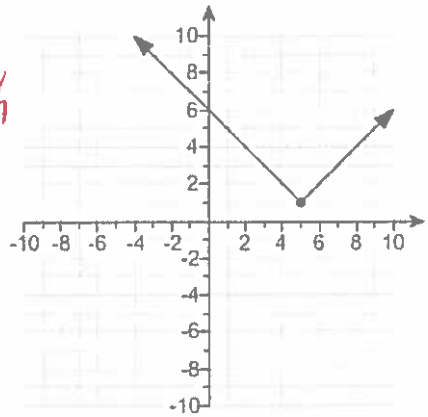
$h(-3) = 2(-3)^2 - 3$
$h(-3) = 2(-3)(-3) - 3$
$h(-3) = 2(9) - 3$
$h(-3) = 18 - 3$
$h(-3) = 15$

$h(0) = 2(0)^2 - 3$
$h(0) = 2(0)(0) - 3$
$h(0) = 2(0) - 3$
$h(0) = 0 - 3$
$h(0) = -3$

$h(4) = 2(4)^2 - 3$
$h(4) = 2(4)(4) - 3$
$h(4) = 2(16) - 3$
$h(4) = 32 - 3$
$h(4) = 29$

44.

Find the domain and the range of the function graphed to the right.



Left Right graph

domain $(-\infty, \infty)$

range $[1, \infty)$

bottom top graph

The domain in interval notation is ____.

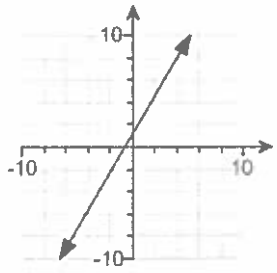
The range in interval notation is ____.

Answers $(-\infty, \infty)$

$[1, \infty)$

45.

Find the domain and the range of the function graphed to the right.



Left Right graph

domain $(-\infty, \infty)$

range $(-\infty, \infty)$

bottom top graph

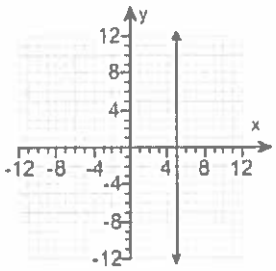
The domain in interval notation is ____.

The range in interval notation is ____.

Answers $(-\infty, \infty)$

$(-\infty, \infty)$

46.



Find the domain and the range of the relation.

domain {5} Left right

range $(-\infty, \infty)$ bottom top

Choose the correct domain.

- A. $(-\infty,5) \cup (5,\infty)$
- B. {5}
- C. $(-\infty,\infty)$
- D. None of the above

Choose the correct range.

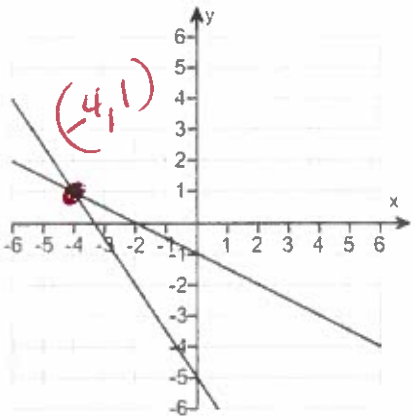
- A. $(-\infty,5) \cup (5,\infty)$
- B. $(-\infty,\infty)$
- C. {5}
- D. None of the above

Answers B. {5}

B. $(-\infty,\infty)$

47.

Find the coordinates of the point of intersection.



The point of intersection is ____.
(Type an ordered pair.)

(-4, 1)

left -4 up 1

Answer: (-4,1)

48. Given the function $f(x) = x^2 - 12$, find the indicated values.

a) f(12) b) f(a)

a) f(12) = ____ (Simplify your answer.)

b) f(a) = ____ (Simplify your answer.)

$f(12) = (12)^2 - 12$

$f(12) = (12)(12) - 12$

$f(12) = 144 - 12$

$f(12) = 132$

$f(a) = (a)^2 - 12$

$f(a) = a^2 - 12$

Answers 132

$a^2 - 12$

49. Determine whether each ordered pair is a solution of the system of linear equations.

$$\begin{cases} x + y = 3 \\ 2x + 3y = 7 \end{cases}$$

a. (2,1)
b. (1,2)

a. Is (2,1) a solution?

- ○ Yes
- ○ No

b. Is (1,2) a solution?

- ○ No
- ○ Yes

Answers Yes
No

$x+y=3$ (2,1) $x\ y$
$2x+3y=7$
$(2)+(1)=3$ YES
$2+1=3$
$3=3$ YES
$2(2)+3(1)=7$
$4+3=7$
$7=7$
Yes
(2,1) is a solution

$x+y=3$ (1,2) $x\ y$
$2x+3y=7$
$(1)+(2)=3$
$1+2=3$
$3=3$ YES
$2(1)+3(2)=7$
$2+6=7$
$8 \neq 7$
NO
(1,2) is Not a Solution

50. Solve the system of equations by substitution. When solving, $x = 3$ is obtained.

$$\begin{aligned} y &= 2x \\ -4x + y &= -6 \end{aligned}$$

$y=2(3)$ subst
$y=6$

$-4x+(6)=-6$
$-4x+6=-6$
$-4x+6-6=-6-6$
$-4x=-12$
$\frac{-4x}{-4}=\frac{-12}{-4}$
$x=3$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ **A.** The solution is _____.
  (Type an ordered pair. Simplify your answer. Use integers or fractions for any numbers in the expression.)
- ○ **B.** There are infinitely many solutions.
- ○ **C.** There is no solution.

$(x, y) = (3, 6)$

Answer: A. The solution is **(3,6)**.
(Type an ordered pair. Simplify your answer. Use integers or fractions for any numbers in the expression.)

51. Solve the system of equations by the substitution method.

$$\begin{cases} y = 4x + 1 \\ 2y - 4x = 14 \end{cases}$$

subst $2(4x+1)-4x=14$
$8x+2-4x=14$
$4x+2=14$
$4x+2-2=14-2$
$4x=12$
$\frac{4x}{4}=\frac{12}{4}$
$x=3$

subst
$y=4x+1$
$y=4(3)+1$
$y=12+1$
$y=13$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ **A.** The solution is _____. (Simplify your answer. Type an ordered pair.)
- ○ **B.** There are infinitely many solutions; $\{(x,y) \mid y = 4x + 1\}$ or $\{(x,y) \mid 2y - 4x = 14\}$.
- ○ **C.** There is no solution; $\{\}$ or $\varnothing$.

Answer: A. The solution is **(3,13)**. (Simplify your answer. Type an ordered pair.)

$(x, y) = (3, 13)$

52. Solve the system of equations by the addition method.

$$\begin{cases} 4x + 6y = 8 \\ 3x - 6y = 27 \end{cases}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution is _____. (Simplify your answer. Type an ordered pair.)
- B. There are infinitely many solutions; $\{(x,y)|4x + 6y = 8\}$ or $\{(x,y)|3x - 6y = 27\}$
- C. There is no solution; {} or ∅.

Answer: A. The solution is (5, −2). (Simplify your answer. Type an ordered pair.)

53. Solve the system of equations by the addition method.

$$\begin{cases} x + 4y = 0 \\ 6x + 3y = -21 \end{cases}$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. The solution is _____. (Simplify your answer. Type an ordered pair.)
- B. There are infinitely many solutions; $\{(x,y)|x + 4y = 0\}$ or $\{(x,y)|6x + 3y = -21\}$.
- C. There is no solution; {} or ∅.

Answer: A. The solution is (−4,1). (Simplify your answer. Type an ordered pair.)

54. Two numbers total 44 and have a difference of 24. Find the two numbers.

The larger number is _____, and the smaller number is _____.

Answers 34, 10

55. Jen Butler has been pricing Speed-Pass train fares for a group trip to New York. Three adults and four children must pay $92. Two adults and three children must pay $65. Find the price of the adult's ticket and the price of a child's ticket.

The price of an adult's ticket is $_____.

The price of a child's ticket is $_____.

Answers 16, 11

56. Kevin and Randy Muise have a jar containing 67 coins, all of which are either quarters or nickels. The total value of the coins in the jar is $12.75. How many of each type of coin do they have?

The jar contains _____ quarters.

The jar contains _____ nickels.

Answers 47

20

$Q+N=67$

$.25Q+.05N=12.75$

$(Q+N=67)(-.05)$

$.25Q+.05N=12.75(1)$

$-.05Q-.05N=-3.35$

$.25Q+.05N=12.75$

$.20Q+0=9.4$

$.20Q=9.4$

$\frac{.20Q}{.20}=\frac{9.4}{.20}$

$Q=47$

$47+N=67$

$47+N-47=67-47$

$N=20$

$(Q,N)=(47,20)$

57. Simplify the following expression by combining the like terms.

$8a^2-8ab+3b^2-2a^2-3ab+5b^2$

$8a^2-8ab+3b^2-2a^2-3ab+5b^2=$ _____

$6a^2-11ab+8b^2$

Answer: $6a^2-11ab+8b^2$

58. Perform the indicated operation.

$(-10x-12)+(8x^2+10x+10)$

$=-10x-12+8x^2+10x+10=$

$(-10x-12)+(8x^2+10x+10)=$ _____ (Simplify your answer.)

$8x^2-2=$

Answer: $8x^2-2$

59. Subtract.

$(5y^2+3y-7)-(-9y+8)$

$=5y^2+3y-7+9y-8=$

$(5y^2+3y-7)-(-9y+8)=$ _____ (Simplify your answer.)

$5y^2+12y-15=$

Answer: $5y^2+12y-15$

60. Multiply.

$(3x-6)(5x-9)=$

$15x^2-27x-30x+54=$

$(3x-6)(5x-9)=$ _____ (Simplify your answer.)

$15x^2-57x+54=$

Answer: $15x^2-57x+54$

61. Multiply.

$(x-6)(x^2-7x+3)$ =

$(x-6)(x^2-7x+3)$ = ☐

Answer: $x^3-13x^2+45x-18$

$x^3-7x^2+3x-6x^2+42x-18=$

$x^3-13x^2+45x-18=$

62. Multiply.

$(x+5)(x^3-4x+3)$ =

$(x+5)(x^3-4x+3)$ = ☐

Answer: $x^4+5x^3-4x^2-17x+15$

$x^4-4x^2+3x+5x^3-20x+15=$

$x^4+5x^3-4x^2-17x+15=$

63. Find the following product.

$(4a-7)(9a^2-5a-1)$ =

$(4a-7)(9a^2-5a-1)$ = ☐

Answer: $36a^3-83a^2+31a+7$

$36a^3-20a^2-4a-63a^2+35a+7=$

$36a^3-83a^2+31a+7=$

64. Multiply vertically.

$(3x-11)(6x+1)$ =

$(3x-11)(6x+1)$ = ☐

Answer: $18x^2-63x-11$

$18x^2+3x-66x-11=$

$18x^2-63x-11=$

65. Multiply vertically.

$(x^2+4x-3)(5x^2+8x-4)$ =

$(x^2+4x-3)(5x^2+8x-4)$ = ☐ (Simplify your answer.)

Answer: $5x^4+28x^3+13x^2-40x+12$

$5x^4+8x^3-4x^2+20x^3+32x^2-16x$

$-15x^2-24x+12=$

$5x^4+28x^3+13x^2-40x+12=$

66. Find the following product.

$(9x + 8)^2$ =

$(9x + 8)^2$ = ____

Answer: $81x^2 + 144x + 64$

$(9x+8)(9x+8) =$

$81x^2 + 72x + 72x + 64 =$

$81x^2 + 144x + 64 =$

67. Find the product using the FOIL method.

$(7x + 3)(4x - 1)$ =

$(7x + 3)(4x - 1)$ = ____

Answer: $28x^2 + 5x - 3$

$28x^2 - 7x + 12x - 3 =$

$28x^2 + 5x - 3 =$

68. Multiply.

$(a - 6)(a + 6)$

$(a - 6)(a + 6)$ = ____ (Simplify your answer.)

Answer: $a^2 - 36$

$a^2 + 6a - 6a - 36 =$

$a^2 - 36 =$

69. Find the product.

$(5x - 9)(5x + 9)$ =

$(5x - 9)(5x + 9)$ = ____

Answer: $25x^2 - 81$

$25x^2 + 45x - 45x - 81 =$

$25x^2 - 81 =$

70. Find the product.

$(6x - 2z)(6x + 2z)$

$(6x - 2z)(6x + 2z)$ = ____

Answer: $36x^2 - 4z^2$

$36x^2 + 12xz - 12xz - 4z^2 =$

$36x^2 - 4z^2 =$

71. Multiply the monomial and the polynomial.

$2x^2(4x^3 - 3x + 8)$ =

$2x^2(4x^3 - 3x + 8) =$ ☐

Answer: $8x^5 - 6x^3 + 16x^2$

$8x^5 - 6x^3 + 16x^2 =$

72. Multiply.

$(9x + 8y)(9x - 8y)$

$(9x + 8y)(9x - 8y) =$ ☐

Answer: $81x^2 - 64y^2$

$81x^2 - 72xy + 72xy - 64y^2$

$81x^2 - 64y^2 =$

73. Simplify. Use positive exponents for any variables. Assume that all bases are not equal to 0.

$\frac{p^{-3}}{q^{-5}}$ =

$\frac{p^{-3}}{q^{-5}} =$ ☐ (Simplify your answer.)

Answer: $\frac{q^5}{p^3}$

$\frac{p^{-3}}{q^{-5}} =$

$\frac{q^5}{p^3}$ =

74. Simplify. Use positive exponents for any variables. Assume that all bases are not equal to 0.

$\frac{x^{-5}}{x^{-8}}$

$\frac{x^{-5}}{x^{-8}} =$ ☐ (Use positive exponents only.)

Answer: x^3

$\frac{x^{-5}}{x^{-8}} =$

$\frac{x^8}{x^5} =$

$x^{8-5} =$

$x^3 =$

75. Simplify the expression. Assume that all bases are not equal to 0.

$(a^{-4}b^{7})^{-5}$ =

$(a^{-4}b^{7})^{-5}$ = ☐ (Use positive exponents only.)

Answer: $\frac{a^{20}}{b^{35}}$

$a^{-4(-5)}b^{7(-5)} = a^{20}b^{-35} = \frac{a^{20}}{b^{35}} =$

76. Simplify the expression. Write the result using positive exponents only. Assume that all bases are not equal to 0.

$\frac{(a^{4}b^{-7})^{-5}}{(5a^{2}b^{-1})^{-2}}$ =

$\frac{(a^{4}b^{-7})^{-5}}{(5a^{2}b^{-1})^{-2}}$ = ☐

Answer: $\frac{25b^{33}}{a^{16}}$

$\frac{a^{4(-5)}b^{-7(-5)}}{5^{1(-2)}a^{2(-2)}b^{-1(-2)}} = \frac{a^{-20}b^{35}}{5^{-2}a^{-4}b^{2}} = \frac{5^{2}a^{4}b^{35}}{a^{20}b^{2}} = \frac{5\cdot 5\,b^{35-2}}{a^{20-4}} = \frac{25b^{33}}{a^{16}}$

77. Divide using synthetic division.

$(6x^2 + 13x + 9) \div (x + 1)$

$(6x^2 + 13x + 9) \div (x + 1)$ = ☐

Answer: $6x + 7 + \frac{2}{x+1}$

$\frac{6x^2+13x+9}{x+1}$ use synthetic division

$-1)\ 6\ \ 13\ \ 9$

$\quad\ \ -6\ \ -7$

$6\ \ 7\ \ (2)$ rem

$6x+7+\frac{2}{x+1}$

78. Factor out the greatest common factor from the polynomial.

$3x + 24$

$3x + 24$ = ☐ (Type your answer in factored form.)

Answer: $3(x + 8)$

$3x+24 =$

$3(x+8) =$

79. Factor out the GCF from the given polynomial.

$36x - 2$

$36x - 2$ = ☐

Answer: $2(18x - 1)$

$36x-2 =$

$2(18x-1) =$

80. Factor the four-term polynomial by grouping.

$x^3 + 2x^2 + 2x + 4$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. $x^3 + 2x^2 + 2x + 4 =$ _____
- B. The polynomial is not factorable by grouping.

Answer: A. $x^3 + 2x^2 + 2x + 4 = (x+2)(x^2+2)$

$x^3+2x^2+2x+4 =$

$(x^3+2x^2)+(2x+4) =$

$x^2(x+2)+2(x+2) =$

$(x+2)(x^2+2) =$

81. Factor.

$32xy - 6x^2$

$32xy - 6x^2 =$ _____ (Factor completely.)

Answer: $2x(16y - 3x)$

$32xy - 6x^2 =$

$2x(16y - 3x) =$

82. Factor the following polynomial.

$-36x^3y^7 - 45x^5y^6$

$-36x^3y^7 - 45x^5y^6 =$ _____ (Factor completely.)

Answer: $9x^3y^6(-4y - 5x^2)$

$-36x^3y^7 - 45x^5y^5 =$

$9x^3y^6(-4y - 5x^2) =$

83. Factor the trinomial completely.

$x^2 - 12x + 32$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. $x^2 - 12x + 32 =$ _____ (Type your answer in factored form.)
- B. The polynomial is prime.

Answer: A. $x^2 - 12x + 32 =$ $(x-4)(x-8)$ (Type your answer in factored form.)

Possibly

32 · 1
16 2
8 4

$(x-4)(x-8) =$

Check

$(x-4)(x-8) =$

$x^2 - 8x - 4x + 32 =$

$x^2 - 12x + 32 =$

Good

84. Factor the trinomial completely.

$x^2 - 5x - 36$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. $x^2 - 5x - 36 =$ _____ (Type your answer in factored form.)
- B. The polynomial is prime.

Answer: A. $x^2 - 5x - 36 =$ **(x + 4)(x − 9)** (Type your answer in factored form.)

$x^2 - 5x - 36 =$

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

Possibly 36.1 18.2 4.9 2.3

Check $(x+4)(x-9)$

$x^2 - 9x + 4x - 36 =$

$x^2 - 5x - 36 =$

Good

85. Factor the trinomial completely.

$7t - 44 + t^2$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. $7t - 44 + t^2 =$ _____ (Factor completely.)
- B. The polynomial is prime.

Answer: A. $7t - 44 + t^2 =$ **(t − 4)(t + 11)** (Factor completely.)

Possibly 44.1 22.2 11.4

$7t - 44 + t^2 =$

$t^2 + 7t - 44 =$

$(t-4)(t+11) =$

Check $(t-4)(t+11) =$

$t^2 + 11t - 4t - 44 =$

$t^2 + 7t - 44 =$

Good

86. Factor completely.

$3x^2 + 17x + 20$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. $3x^2 + 17x + 20 =$ _____ (Factor completely.)
- B. The polynomial is prime.

Answer: A. $3x^2 + 17x + 20 =$ **(3x + 5)(x + 4)** (Factor completely.)

$3x^2 + 17x + 20 =$

$(3x+5)(x+4) =$

Possibly 3.1 20 10.2 4.5

Check $(3x+5)(x+4) =$

$3x^2 + 12x + 5x + 20 =$

$3x^2 + 17x + 20 =$

Good

87. Factor the trinomial completely.

$2x^2 - 9x - 5$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. $2x^2 - 9x - 5 =$ _____ (Factor completely.)
- B. The polynomial is prime.

Answer: A. $2x^2 - 9x - 5 =$ **(2x + 1)(x − 5)** (Factor completely.)

$2x^2 - 9x - 5 =$

$(2x+1)(x-5) =$

Possibly 2.1 5.1

Check $(2x+1)(x-5) =$

$2x^2 - 10x + 1x - 5 =$

$2x^2 - 9x - 5 =$

Good

Formula $a^2 - b^2 = (a+b)(a-b)$

88. Factor the following binomial completely.

$100x^2 - 169y^2$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

$100x^2 - 169y^2 =$
$(10x)^2 - (13y)^2 =$
$(10x + 13y)(10x - 13y)$

- A. $100x^2 - 169y^2 =$ _____ (Factor completely.)
- B. The polynomial is prime.

Answer: A. $100x^2 - 169y^2 =$ **$(10x + 13y)(10x - 13y)$** (Factor completely.)

---

89. Solve the equation.

$(x - 5)(x + 4) = 0$

$(x-5)(x+4) = 0$
$x - 5 = 0$ OR $x + 4 = 0$
$x - 5 + 5 = 0 + 5$ OR $x + 4 - 4 = 0 - 4$
$x = 5$ OR $x = -4$

$x =$ [ ]

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: 5, −4

---

90. Solve the equation.

$3x(x - 7) = 0$

$3x(x-7) = 0$
$3x = 0$ OR $x - 7 = 0$
$\frac{3x}{3} = \frac{0}{3}$ OR $x - 7 + 7 = 0 + 7$
$x = 0$ OR $x = 7$

$x =$ [ ] (Use a comma to separate answers as needed.)

Answer: 7,0

---

91. Solve the equation.

$(5x + 6)(2x - 7) = 0$

$(5x+6)(2x-7) = 0$
$5x + 6 = 0$ OR $2x - 7 = 0$
$5x + 6 - 6 = 0 - 6$ OR $2x - 7 + 7 = 0 + 7$
$5x = -6$ OR $2x = 7$
$\frac{5x}{5} = \frac{-6}{5}$ OR $\frac{2x}{2} = \frac{7}{2}$
$x = -\frac{6}{5}$ OR $x = \frac{7}{2}$

$x =$ [ ]

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: $-\frac{6}{5}, \frac{7}{2}$

---

92. Solve the equation.

$x^2 - 12x + 32 = 0$

$x^2 - 12x + 32 = 0$
$(x - 4)(x - 8) = 0$
$x - 4 = 0$ OR $x - 8 = 0$
$x - 4 + 4 = 0 + 4$ OR $x - 8 + 8 = 0 + 8$
$x = 4$ OR $x = 8$

Possible
32.1
16.2
4.8

$x =$ [ ]

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: 4,8

93. Solve.

$x^2 + 5x - 14 = 0$

x = ____

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: −7,2

$x^2+5x-14=0$

$(x-2)(x+7)=0$

$x-2=0$ OR $x+7=0$

$x-2+2=0+2$ OR $x+7-7=0-7$

$x=2$ OR $x=-7$

94. Solve.

$x^2 - 10x = 0$

x = ____

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: 0,10

$x^2-10x=0$

$x(x-10)=0$

$x=0$ OR $x-10=0$

$x=0$ OR $x-10+10=0+10$

$x=0$ OR $x=10$

95. Solve the equation.

$x^2 - 5x = 14$

x = ____

(Use a comma to separate answers as needed.)

Answer: 7, −2

$x^2-5x=14$

$x^2-5x-14=14-14$

$x^2-5x-14=0$

$(x+2)(x-7)=0$

$x+2=0$ OR $x-7=0$

$x+2-2=0-2$ OR $x-7+7=0+7$

$x=-2$ OR $x=7$

96. Solve the equation.

$x^3 - 12x^2 + 27x = 0$

x = ____

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: 0,3,9

$x^3-12x^2+27x=0$

$x(x^2-12x+27)=0$

$x(x-3)(x-9)=0$

$x=0$ OR $x-3=0$ OR $x-9=0$

$x=0$ OR $x-3+3=0+3$ OR $x-9+9=0+9$

$x=0$ OR $x=3$ OR $x=9$

97. Solve the equation.

$25x^3 - x = 0$

x = ____

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: $0, \frac{1}{5}, -\frac{1}{5}$

$25x^3-x=0$

$x(25x^2-1)=0$

$x((5x)^2-(1)^2)=0$

$x(5x+1)(5x-1)=0$

$x=0$ OR $5x+1=0$ OR $5x-1=0$

$x=0$ OR $5x+1-1=0-1$ OR $5x-1+1=0+1$

$x=0$ OR $5x=-1$ OR $5x=1$

$x=0$ OR $\frac{5x}{5}=\frac{-1}{5}$ OR $\frac{5x}{5}=\frac{1}{5}$

$x=0$ OR $x=-\frac{1}{5}$ OR $x=\frac{1}{5}$

98. Solve.

$x^2 - 8 = -2x$

$x =$ ____

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: $-4, 2$

$x^2 - 8 = -2x$
$x^2 - 8 + 2x = -2x + 2x$
$x^2 + 2x - 8 = 0$
$(x - 2)(x + 4) = 0$
$x - 2 = 0$ OR $x + 4 = 0$
$x - 2 + 2 = 0 + 2$ OR $x + 4 - 4 = 0 - 4$
$x = 2$ OR $x = -4$

Possible: 8.1, 2.4

99. Solve.

$7x^2 - 6x - 1 = 0$

$x =$ ____

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: $-\frac{1}{7}, 1$

$7x^2 - 6x - 1 = 0$
$(7x + 1)(x - 1) = 0$
$7x + 1 = 0$ OR $x - 1 = 0$
$7x + 1 - 1 = 0 - 1$ OR $x - 1 + 1 = 0 + 1$
$7x = -1$
$\frac{7x}{7} = \frac{-1}{7}$
$x = -\frac{1}{7}$ OR $x = 1$

Possible: 7.1, 1.1

100. Solve the equation.

$4x^2 - 12x - 40 = 0$

$x =$ ____

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: $-2, 5$

$4x^2 - 12x - 40 = 0$
$4(x^2 - 3x - 10) = 0$
$4(x + 2)(x - 5) = 0$
$4 \neq 0$ OR $x + 2 = 0$ OR $x - 5 = 0$
$x + 2 - 2 = 0 - 2$ OR $x - 5 + 5 = 0 + 5$
$x = -2$ OR $x = 5$

Possible: 10.1, 5.2

101. Solve.

$x^2 + 20x + 100 = 0$

$x =$ ____

(Simplify your answer. Type each solution only once. Use a comma to separate answers as needed.)

Answer: -10

$x^2 + 20x + 100 = 0$
$(x + 10)(x + 10) = 0$
$x + 10 = 0$ OR $x + 10 = 0$
$x + 10 - 10 = 0 - 10$ OR $x + 10 - 10 = 0 - 10$
$x = -10$ OR $x = -10$

only 1 {-10}

102. Find the x-intercepts of the graph of $y = (4x + 3)(x - 9)$.

The x-intercepts are ____.

(Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)

Answer: $\left(-\frac{3}{4}, 0\right), (9, 0)$

find x-intercept let $y = 0$
$0 = (4x + 3)(x - 9)$
$4x + 3 = 0$ OR $x - 9 = 0$
$4x + 3 - 3 = 0 - 3$ OR $x - 9 + 9 = 0 + 9$
$4x = -3$ OR $x = 9$
$\frac{4x}{4} = \frac{-3}{4}$
$x = -\frac{3}{4}$

2 points: $(-\frac{3}{4}, 0)$, $(9, 0)$

103. Find the x-intercepts of the graph of $y = x^2 - 2x - 3$.

The x-intercepts are ____.

(Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)

Answer: (3,0),(−1,0)

Find x-intercepts let $y=0$

$0 = x^2 - 2x - 3$

$0 = (x+1)(x-3)$

$x+1=0$ or $x-3=0$

$x+1-1=0-1$ or $x-3+3=0+3$

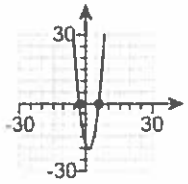
$x=-1$ or $x=3$

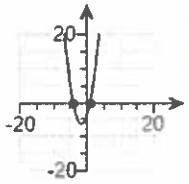
(3,0) (−1,0) points

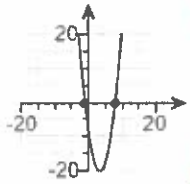
104. Choose the graph that matches the equation.

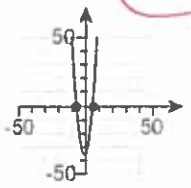
$y = (x+1)(x-8)$

○ A. ○ B. ● C. ○ D.









$x+1=0$ $x-8=0$

$x+1-1=0-1$ $x-8+8=0+8$

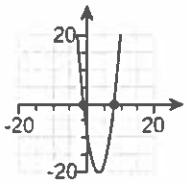
$x=-1$ $x=8$

(−1,0)

(8,0)

Points

Answer:



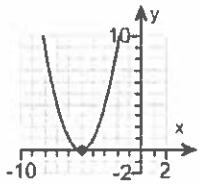
C.

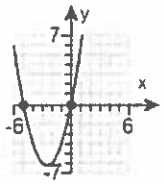
105. Match the equation with its graph.

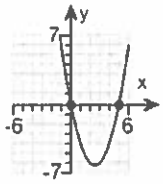
$y = x(x+5)$

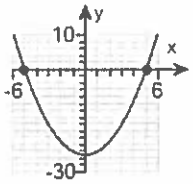
Choose the correct graph below.

○ A. ● B. ○ C. ○ D.









$x(x+5)=0$

$x=0$ or $x+5=0$

$x=0$ or $x+5-5=0-5$

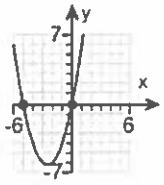
$x=0$ or $x=-5$

(0,0)

(−5,0)

Points

Answer:



B.

106. Write a quadratic equation that has two solutions, 9 and −2.

Choose the correct answer below.

- A. $x(x-18)=0$
- B. $-9x(x+2)=0$
- C. $(x+9)(x-2)=0$
- D. $(x+9)(x+2)=0$
- E. $9x(x-2)=0$
- F. $(x-9)(x+2)=0$

Answer: F. $(x-9)(x+2)=0$

107. Find the dimensions of a rectangle whose width is 4 miles less than its length, and whose area is 96 square miles.

The length of the rectangle is ____ miles.

The width of the rectangle is ____ miles.

Answers 12

8

108. Simplify the expression.

$$\frac{-2a-2b}{a+b}$$

Select the correct choice below and fill in any answer boxes in your choice.

- A. $\frac{-2a-2b}{a+b}=$ ____ (Simplify your answer.)
- B. The expression cannot be simplified.

Answer: A. $\frac{-2a-2b}{a+b}=$ −2 (Simplify your answer.)

109. Find the quotient and simplify the result.

$$\frac{6x^4}{y^3} \div \frac{3x^4y^3}{4}$$

$\frac{6x^4}{y^3} \div \frac{3x^4y^3}{4} =$ ____ (Simplify your answer.)

Answer: $\frac{8}{y^6}$

110. Add. Simplify the result if possible.

$$\frac{5}{8+y}+\frac{y+2}{8+y}$$

$$\frac{5}{8+y}+\frac{y+2}{8+y}=$$ _____ (Simplify your answer.)

Answer: $\frac{y+7}{8+y}$

$\frac{(5)+(y+2)}{8+y}=$

$\frac{5+y+2}{8+y}=$

$\frac{y+7}{8+y}=$

111. Solve the equation.

$$\frac{z-5}{2}=\frac{z}{7}$$

$\frac{z-5}{2}=\frac{z}{7}$

$7(z-5)=2(z)$ cross mult

$7z-35=2z$

$7z-35+35=2z+35$

$7z=2z+35$

$7z-2z=2z+35-2z$

$5z=35$

$\frac{5z}{5}=\frac{35}{5}$

$z=7$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution is _____. (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)
- B. There is no solution.

Answer: A. The solution is 7. (Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

112. Write an equation of the line using function notation.

Slope 0; through (−2, −5)

The equation of the line is f(x) = _____.

Answer: −5

Point $=(-2,-5)$ x_1, y_1

Slope $=m=0$

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

$y-(-5)=0(x-(-2))$

$y+5=0(x+2)$

$y+5=0$

$y+5-5=0-5$

$y=-5$

OR

$f(x)=-5$

113. The function f(x) = 0.23x + 12.3 can be used to predict diamond production. For this function, x is the number of years after 2000, and f(x) is the value (in billions of dollars) of the year's diamond production. Use this function to predict diamond production in 2002.

The diamond production in 2002 is predicted to be $ _____ billion. (Type an integer or a decimal.)

Answer: 12.76

$f(x)=0.23x+12.3$

$f(2)=0.23(2)+12.3$

$f(2)=0.46+12.3$

$f(2)=12.76$

2002
− 2000
2

0.46
+12.30
12.76

114. If y varies directly as x, find the constant of variation k and the direct variation equation for the situation.

y = 8 when x = 24

Find the constant of variation k.

k = [ ] (Type an integer or a fraction. Simplify your answer.)

Complete the direct variation equation given y = 8 when x = 24.

y = [ ] (Use integers or fractions for any numbers in the expression.)

Answers $\frac{1}{3}$

$\frac{1}{3}x$

y Varia directly as x

$y = kx$

$8 = k(24)$

$8 = 24k$

$\frac{8}{24} = \frac{24k}{24}$

$\frac{8(1)}{8(3)} = k$

$\frac{1}{3} = k$

$y = \frac{1}{3}x$

115. The amount P of pollution varies directly with the population N of people. City A has a population of 442,000 and produces 260,000 tons of pollutants. Find how many tons of pollution we should expect City B to produce, if we know that its population is 350,000.

City B produces [ ] tons of pollution.

(Do not round until the final answer. Then round to the nearest ton as needed.)

Answer: 205,882

$y = kx$ $K = .588235294$

$y = .588235294x$

$y = .588235294(350000)$

$y = 205,882.353$

$260000 = k(442000)$

$\frac{260000}{442000} = \frac{k(442000)}{442000}$

116. Solve the absolute value equation.

$|2x - 7| = 9$

Formula

$|x| = a$

$x = -a$ or $x = a$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. The solution set is { [ ] }.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

B. The solution set is ∅.

Answer: A. The solution set is { 8, −1 }.
(Type an integer or a simplified fraction. Use a comma to separate answers as needed.)

$|2x - 7| = 9$

$2x - 7 = -9$ or $2x - 7 = 9$

$2x - 7 + 7 = -9 + 7$ or $2x - 7 + 7 = 9 + 7$

$2x = -2$ or $2x = 16$

$\frac{2x}{2} = \frac{-2}{2}$ or $\frac{2x}{2} = \frac{16}{2}$

$x = -1$ or $x = 8$

117. Solve the inequality. Then graph the solution set.

$|x-7|<4$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- ○ **A.** The solution is one or more intervals. The solution is _____.
  (Simplify your answer. Type your answer in interval notation. Use integers or fractions for any numbers in the expression.)
- ○ **B.** There are only one or two solutions. The solution set is {_____}.
  (Type an integer or a fraction. Use a comma to separate answers as needed.)
- ○ **C.** There is no solution.

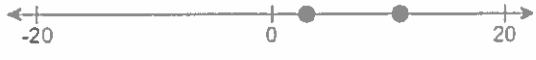
Choose the correct graph below.

○ **A.**

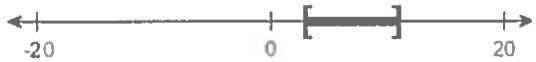
○ **B.**

○ **C.**

○ **D.**



○ **E.**



○ **F.**

Answers A. The solution is one or more intervals. The solution is **(3,11)**.
(Simplify your answer. Type your answer in interval notation. Use integers or fractions for any numbers in the expression.)

A.

formula
$|x|<a$
$-a<x<a$

$|x-7|<4$

$-4<x-7<4$

$-4+7<x-7+7<4+7$

$3<x<11$

$(3, 11)$

118. Solve the inequality. Graph the solution set.

$|x+1| \geq 17$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

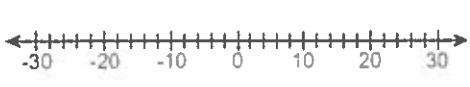
- A. The solution is one or more intervals. The solution is _____
  (Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression.)
- B. There are only one or two solutions. The solution set is { }.
  (Use a comma to separate answers as needed.)
- C. There is no solution.

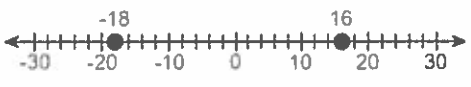
Choose the correct graph below.

A. 

B. 

C. 

D. 

E. 

F. 

Answers A. The solution is one or more intervals. The solution is $(-\infty, -18] \cup [16, \infty)$.
(Type your answer in interval notation. Simplify your answer. Use integers or fractions for any numbers in the expression.)

C. 

119. Determine which ordered pairs given are solutions of the linear inequality in two variables.

$x - y > 4$; $(2, -2), (9,4)$

Is the ordered pair $(2, -2)$ a solution to the inequality?

- Yes
- No

Is the ordered pair (9,4) a solution to the inequality?

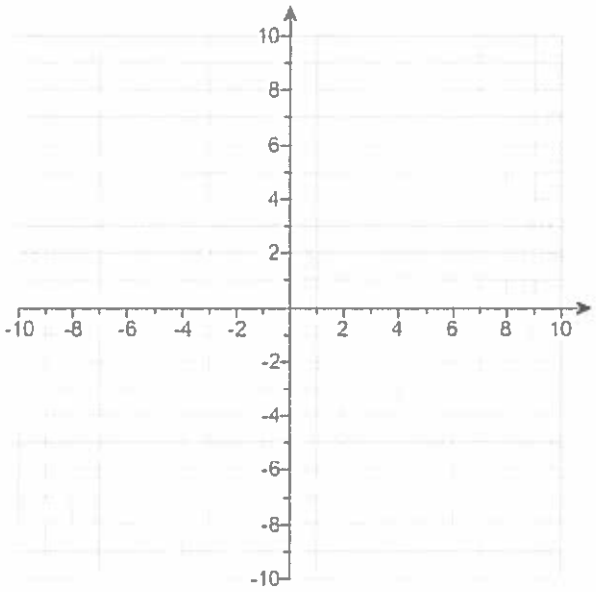
- Yes
- No

Answers No

Yes

120. Graph the inequality $x + y \geq 1$.

Use the graphing tool to graph the inequality.



$x+y \geq 1$

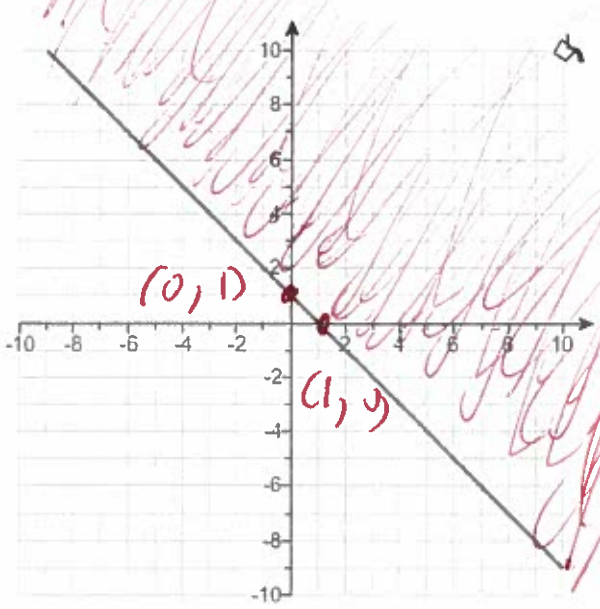
$x+y-x \geq 1-x$

$y \geq 1-x$

graph $y = 1-x$

Solve for y

Answer:



$y = 1-x$

$y = 1-(0)$

$y = 1-0$

$y = 1$

x	y
0	1
1	0

$y = 1-(1)$

$y = 1-1$

$y = 0$

121. Determine whether (1,1) is included in the graph.

$2x + 7y < 10$

Is (1,1) included in the graph?

- ○ No
- ○ Yes

Answer: Yes

$2x+7y<10$ (1, 1) x y

$2(1)+7(1)<10$

$2+7<10$

$9<10$

YES

122. Simplify the radical. Assume that all variables represent positive real numbers.

$\sqrt{25a^8b^{26}}$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

$\sqrt{25a^8b^{26}}$

$5a^{8/2}b^{26/2}=$

$5a^4b^{13}=$

- A. $\sqrt{25a^8b^{26}}$ = _____
- B. The square root is not a real number.

Answer: A. $\sqrt{25a^8b^{26}}$ = $5a^4b^{13}$

123. Identify the domain and then graph the function, using the table to the right.

x	f(x)
2	
3	
6	
11	

$f(x)=\sqrt{x-2}$

The domain of the function f(x) is _____.
(Type your answer in interval notation.)

Complete the table to the right.

Graph the function. Choose the correct graph to the right.

$f(2)=\sqrt{2-2}=\sqrt{0}=0$

$f(3)=\sqrt{3-2}=\sqrt{1}=1$

$f(6)=\sqrt{6-2}=\sqrt{4}=2$

$f(11)=\sqrt{11-2}=\sqrt{9}=3$

Points

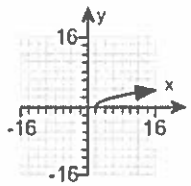
Answers [2,∞)

0

1

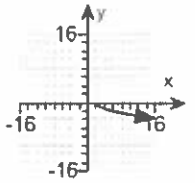
2

3

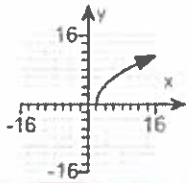


D.

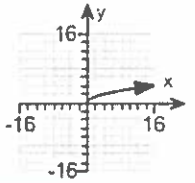
- A.



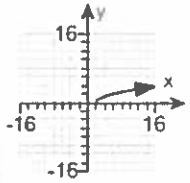
- B.



- C.



- D.



X	f(x)
2	0
3	1
6	2
11	3

Points to Graph
(2, 0)
(3, 1)
(6, 2)
(11, 3)

Domain $[2, \infty)$

Range $[0, \infty)$

124. Use radical notation to write the expression. Simplify if possible. Assume that all variables represent nonnegative quantities.

$(81x^8)^{\frac{1}{2}}$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. $(81x^8)^{\frac{1}{2}}$ = _____
(Simplify your answer. Type an exact answer, using radicals as needed.)

B. The answer is not a real number.

Answer: A. $(81x^8)^{\frac{1}{2}}$ = $9x^4$ (Simplify your answer. Type an exact answer, using radicals as needed.)

125. Use radical notation to rewrite the expression. Simplify if possible.

$16^{3/4}$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

A. $16^{3/4}$ = _____
(Simplify your answer. Type an exact answer, using radicals as needed.)

B. The answer is not a real number.

Answer: A. $16^{3/4}$ = 8 (Simplify your answer. Type an exact answer, using radicals as needed.)

126. Simplify by factoring.

$\sqrt{63}$

$\sqrt{63}$ = _____
(Type an exact answer, using radicals as needed.)

Answer: $3\sqrt{7}$

127. Simplify. Assume that the variables represent nonnegative real numbers.

$\sqrt{36a^2b^7}$

$\sqrt{36a^2b^7}$ = _____ (Type an exact answer, using radicals as needed.)

Answer: $6ab^3\sqrt{b}$

128. Rationalize the denominator.

$$\left(\frac{\sqrt{7}-\sqrt{6}}{\sqrt{7}+\sqrt{6}}\right)\left(\frac{\sqrt{7}-\sqrt{6}}{\sqrt{7}-\sqrt{6}}\right)=\frac{(\sqrt{7})^2-\sqrt{7}\sqrt{6}-\sqrt{7}\sqrt{6}+\sqrt{6}^2}{(\sqrt{7})^2-\sqrt{7}\sqrt{6}+\sqrt{7}\sqrt{6}-(\sqrt{6})^2}=\frac{7-2\sqrt{7}\sqrt{6}+6}{7-6}=$$

$$\frac{13-\sqrt{7}\sqrt{6}}{1}=\frac{13-2\sqrt{42}}{1}=13-2\sqrt{42}=$$

$\frac{\sqrt{7}-\sqrt{6}}{\sqrt{7}+\sqrt{6}}=$ _____ (Type an exact answer, using radicals as needed.)

Answer: $13-2\sqrt{42}$

129. Solve.

$\sqrt{x-11}=2$

$(\sqrt{x-11})^2=(2)^2$

$x-11=4$

$x-11+11=4+11$

$x=15$

Check

$\sqrt{15-11}=2$

$\sqrt{4}=2$

$2=2$ Good

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The solution(s) is(are) x = _____. (Use a comma to separate answers as needed.)
- B. The solution set is ∅.

Answer: A. The solution(s) is(are) x = 15. (Use a comma to separate answers as needed.)

130. Solve.

$\sqrt{x+1}=\sqrt{2x-7}$

$(\sqrt{x+1})^2=\sqrt{2x-7}^2$

$x+1=2x-7$

$x+1-1=2x-7-1$

$x=2x-8$

$1x-2x=2x-8-2x$

$-1x=-8$

$\frac{-1x}{-1}=\frac{-8}{-1}$

$x=8$

Check

$\sqrt{8+1}=\sqrt{2(8)-7}$

$\sqrt{9}=\sqrt{16-7}$

$\sqrt{9}=\sqrt{9}$

$3=3$ Good

Select the correct choice below and fill in any answer boxes present in your choice.

- A. x = _____ (Simplify your answer. Use a comma to separate answers as needed.)
- B. There is no solution.

Answer: A. x = 8 (Simplify your answer. Use a comma to separate answers as needed.)

131. Use the square root property to solve the equation. The equation has real number solutions.

$(x+9)^2=4$

$\sqrt{(x+9)^2}=\pm\sqrt{4}$

$x+9=\pm 2$

$x+9=-2$ or $x+9=2$

$x+9-9=-2-9$ or $x+9-9=2-9$

x = _____

(Simplify your answer. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

Answer: −7, −11

$x=-11$ or $x=-7$

Check

$(-11+9)^2=4$

$(-2)^2=4$

$(-2)(-2)=4$

$4=4$ Good

$(-7+9)^2=4$

$(2)^2=4$

$(2)(2)=4$

$4=4$ Good

132. Use the quadratic formula to solve the equation.

$m^2 + 7m + 10 = 0$

$m =$ [ ]

(Simplify your answer. Type an exact answer, using radicals as needed. Use a comma to separate answers as needed.)

Answer: $-5, -2$

$a=1 \quad b=7, c=10$

$m = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$m = \frac{-(7) \pm \sqrt{(7)^2-4(1)(10)}}{2}$

$m = \frac{-7 \pm \sqrt{49-40}}{2}$

$m = \frac{-7 \pm \sqrt{9}}{2}$

$m = \frac{-7 \pm 3}{2}$

$m = \frac{-7-3}{2}$ OR $m = \frac{-7+3}{2}$

$m = -\frac{10}{2}$ OR $m = -\frac{4}{2}$

$m = -5$ OR $m = -2$

133. Use the quadratic formula to solve the equation.

$x^2 + 6x + 13 = 0$

The solution(s) is/are $x =$ [ ].

(Simplify your answer. Type an exact answer, using radicals and i as needed. Use a comma to separate answers as needed.)

Answer: $-3+2i, -3-2i$

$1x^2 + 6x + 13 = 0$

$a=1, \quad b=6, \quad c=13$

$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$

$x = \frac{-(6) \pm \sqrt{(6)^2-4(1)(13)}}{2(1)}$

$x = \frac{-6 \pm \sqrt{36-52}}{2}$

$x = \frac{-6 \pm \sqrt{-16}}{2}$

$x = \frac{-6 \pm 4i}{2}$

$x = -3 \pm 2i$

$x = -3-2i$ OR $x = -3+2i$

134.

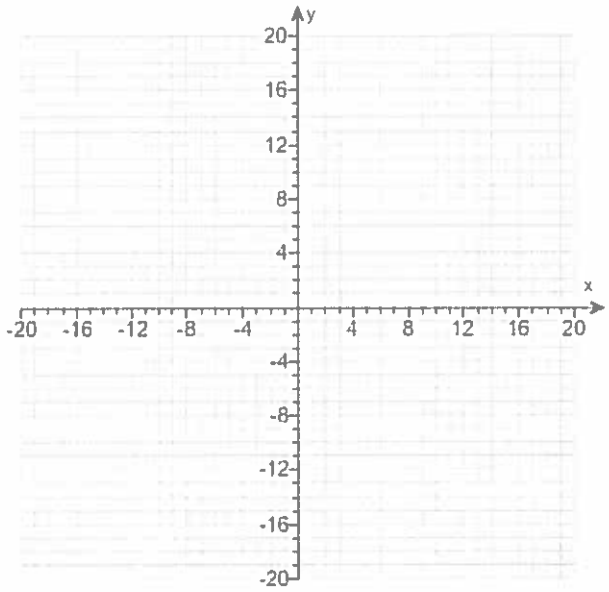
Sketch the graph of the quadratic function and the axis of symmetry. State the vertex, and give the equation for the axis of symmetry.

$h(x) = x^2 + 1$

Use the graphing tool to graph the function as a solid curve and the axis of symmetry as a dashed line.

The vertex is _____.
(Type an ordered pair.)

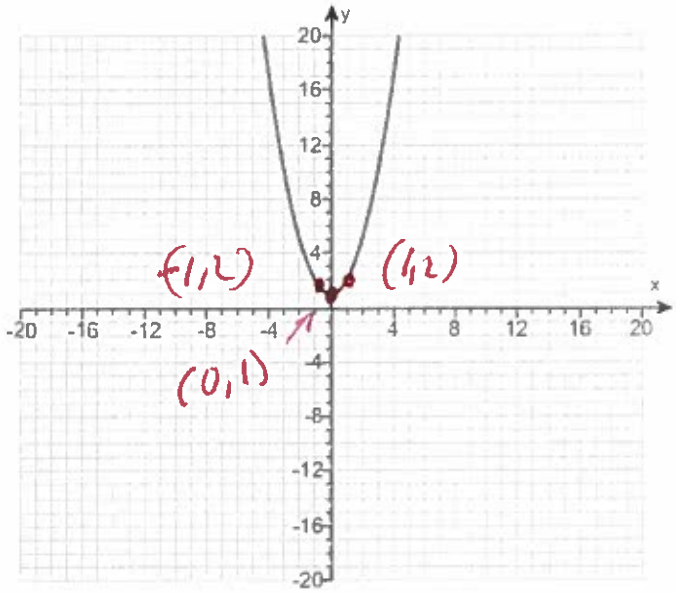
The axis of symmetry is _____.
(Type an equation.)



$h(x) = x^2 + 1$

x	h(x)
-1	2
0	1
1	2

Answers



(0,1)

x = 0

$h(-1) = (-1)^2 + 1$
$h(-1) = (-1)(-1) + 1$
$h(-1) = 1 + 1$
$h(-1) = 2$

$h(0) = (0)^2 + 1$
$h(0) = (0)(0) + 1$
$h(0) = 0 + 1$
$h(0) = 1$

$h(1) = (1)^2 + 1$
$h(1) = (1)(1) + 1$
$h(1) = 1 + 1$
$h(1) = 2$

135.

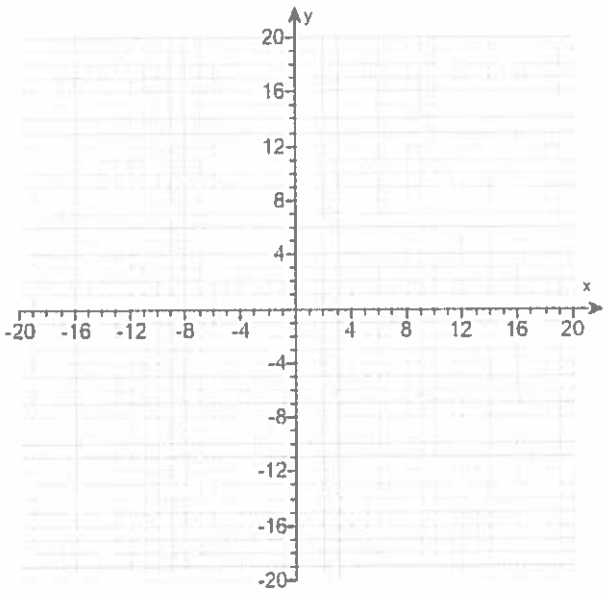
Sketch the graph of the quadratic function and the axis of symmetry. State the vertex, and give the equation for the axis of symmetry.

$f(x) = (x-4)^2$

Use the graphing tool to graph the function as a solid curve and the axis of symmetry as a dashed line.

The vertex is [ ].
(Type an ordered pair.)

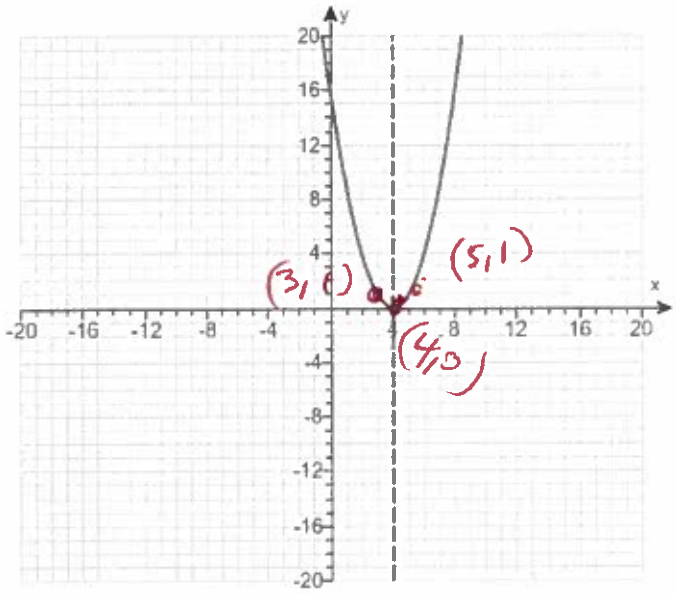
The axis of symmetry is [ ].
(Type an equation.)



$f(x) = (x-4)^2$

x	f(x)
3	1
4	0
5	1

Answers



(4,0)

x = 4

$f(3) = (3-4)^2$
$f(3) = (-1)^2$
$f(3) = (-1)(-1)$
$f(3) = 1$

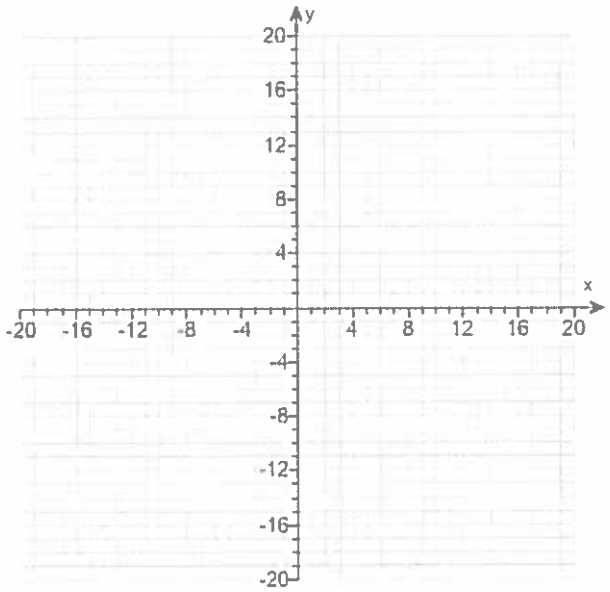
$f(4) = (4-4)^2$
$f(4) = (0)^2$
$f(4) = (0)(0)$
$f(4) = 0$

$f(5) = (5-4)^2$
$f(5) = (1)^2$
$f(5) = (1)(1)$
$f(5) = 1$

136.

Sketch the graph of the quadratic function and the axis of symmetry. State the vertex, and give the equation for the axis of symmetry.

$$f(x) = \frac{1}{2}(x-4)^2 - 5$$



Use the graphing tool to graph the function as a solid curve and the axis of symmetry as a dashed line.

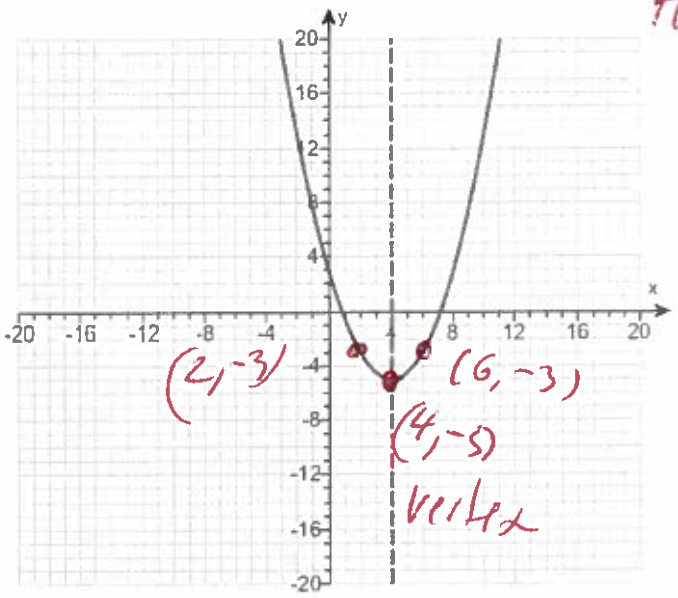
What is the vertex of the graph?
The vertex is [ ].
(Type an ordered pair.)

What is the equation of the axis of symmetry?
[ ]
(Type an equation.)

$f(x) = \frac{1}{2}(x-4)^2 - 5$

x	f(x)
2	-3
4	-5
6	-3

Answers



(4, – 5)

x = 4

$f(2) = \frac{1}{2}(2-4)^2 - 5$
$f(2) = \frac{1}{2}(-2)^2 - 5$
$f(2) = \frac{1}{2}(-2)(-2) - 5$
$f(2) = \frac{1}{2}(4) - 5$
$f(2) = \frac{4}{2} - 5$
$f(2) = 2 - 5$
$f(2) = -3$

$f(4) = \frac{1}{2}(4-4)^2 - 5$
$f(4) = \frac{1}{2}(0)^2 - 5$
$f(4) = \frac{1}{2}(0)(0) - 5$
$f(4) = \frac{1}{2}(0) - 5$
$f(4) = 0 - 5$
$f(4) = -5$

$f(6) = \frac{1}{2}(6-4)^2 - 5$
$f(6) = \frac{1}{2}(2)^2 - 5$
$f(6) = \frac{1}{2}(2)(2) - 5$
$f(6) = \frac{1}{2}(4) - 5$
$f(6) = \frac{4}{2} - 5$
$f(6) = 2 - 5$
$f(6) = -3$

137.

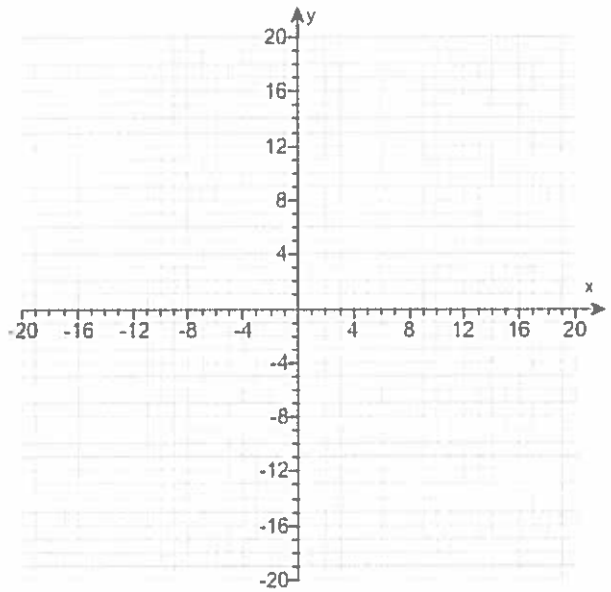
Sketch the graph of the quadratic function and the axis of symmetry. State the vertex, and give the equation for the axis of symmetry.

$f(x) = -4(x-5)^2 - 3$

Use the graphing tool to graph the function as a solid curve and the axis of symmetry as a dashed line.

The vertex is [ ].
(Type an ordered pair.)

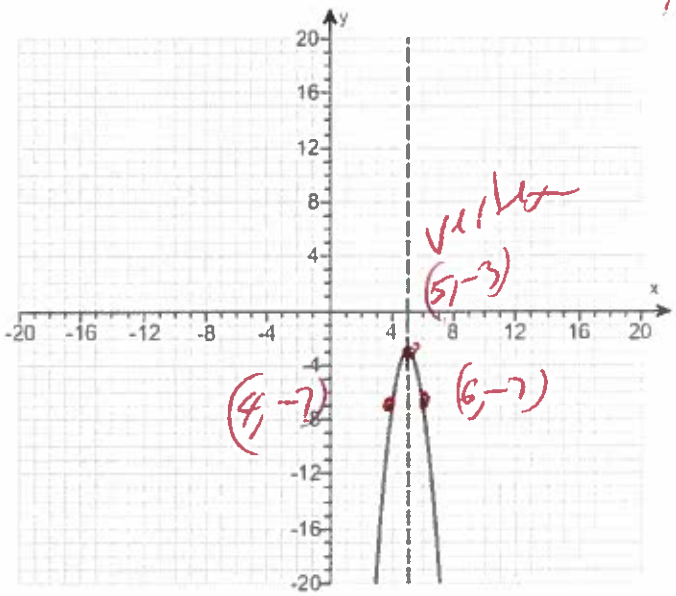
The axis of symmetry is [ ].
(Type an equation.)



$f(x) = -4(x-5)^2 - 3$

x	f(x)
4	-7
5	-3
6	-7

Answers



(5, – 3)

x = 5

$f(4) = -4(4-5)^2 - 3$
$f(4) = -4(-1)^2 - 3$
$f(4) = -4(-1)(-1) - 3$
$f(4) = -4(1) - 3$
$f(4) = -4 - 3$
$f(4) = -7$

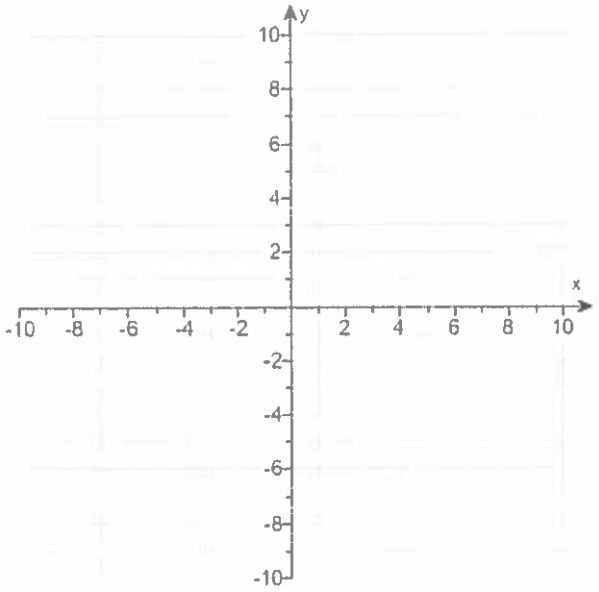
$f(5) = -4(5-5)^2 - 3$
$f(5) = -4(0)^2 - 3$
$f(5) = -4(0)(0) - 3$
$f(5) = -4(0) - 3$
$f(5) = 0 - 3$
$f(5) = -3$

$f(6) = -4(6-5)^2 - 3$
$f(6) = -4(1)^2 - 3$
$f(6) = -4(1)(1) - 3$
$f(6) = -4(1) - 3$
$f(6) = -4 - 3$
$f(6) = -7$

138.

Find the vertex of the graph of the quadratic function. Determine whether the graph opens upward or downward, find any intercepts, and sketch the graph.

$f(x) = -x^2 - 6x - 5$



The vertex is ☐.
(Simplify your answer. Type an ordered pair.)

Does the graph open upward or downward?

- ○ The parabola opens downward.
- ○ The parabola opens upward.

Find any x-intercepts of the graph.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ **A.** The x-intercept(s) is(are) _____.
  (Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)
- ○ **B.** There is no x-intercept.

Find any y-intercepts of the graph.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ **A.** The y-intercept(s) is(are) _____.
  (Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)
- ○ **B.** There is no y-intercept.

Use the graphing tool to graph the function.

$f(x) = -x^2 - 6x - 5$

$a = -1,\ b = -6,\ c = -5$

$\text{Vertex} = \left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right)\right)$

$\text{Vertex} = \left(-\frac{-(-6)}{2(-1)}, f\left(-\frac{-(-6)}{2(-1)}\right)\right)$

$\text{Vertex} = \left(\frac{6}{-2}, f\left(\frac{6}{-2}\right)\right)$

$= (-3, f(-3))$

$\text{Vertex} = (-3, -(-3)^2 - 6(-3) - 5)$

$\text{Vertex} = (-3, -(-3)(-3) - 6(-3) - 5)$

$\text{Vertex} = (-3, -(9) - 6(-3) - 5)$

$\text{Vertex} = (-3, -9 + 18 - 5)$

$\text{Vertex} = (-3, 9 - 5)$

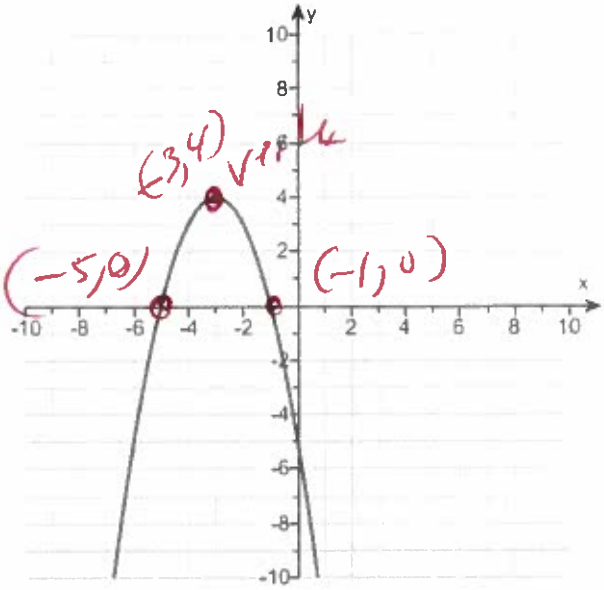
$\text{Vertex} = (-3, 4)$

Answers (− 3,4)

The parabola opens downward.

A. The x-intercept(s) is(are) **(− 5,0),(− 1,0)** .
(Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)

A. The y-intercept(s) is(are) **(0, − 5)** .
(Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)



$f(x) = -x^2 - 6x - 5$

x	f(x)
-5	0
-3	4
-1	0

$f(-5) = -(-5)^2 - 6(-5) - 5$
$f(-5) = -(-5)(-5) - 6(-5) - 5$
$f(-5) = -(25) - 6(-5) - 5$
$f(-5) = -25 + 30 - 5$
$f(-5) = 5 - 5$
$f(-5) = 0$

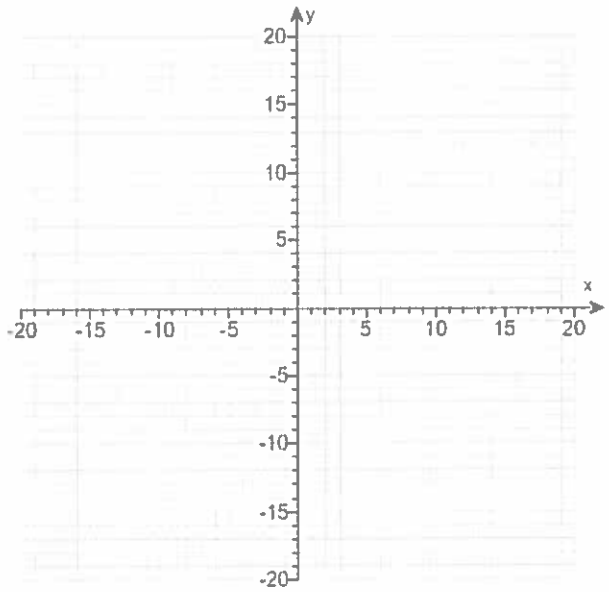
$f(-3) = -(-3)^2 - 6(-3) - 5$
$f(-3) = -(-3)(-3) - 6(-3) - 5$
$f(-3) = -(9) - 6(-3) - 5$
$f(-3) = -9 + 18 - 5$
$f(-3) = 9 - 5$
$f(-3) = 4$

$f(-1) = -(-1)^2 - 6(-1) - 5$
$f(-1) = -(-1)(-1) - 6(-1) - 5$
$f(-1) = -(1) - 6(-1) - 5$
$f(-1) = -1 + 6 - 5$
$f(-1) = 5 - 5$
$f(-1) = 0$

139.

Find the vertex of the graph of the quadratic function. Determine whether the graph opens upward or downward, find any intercepts, and sketch the graph.

$f(x) = x^2 - 9$



The vertex of the quadratic function is the point ____.
(Type your answer as an ordered pair.)

Does the graph open upward or downward?

- A. The parabola opens downward.
- B. The parabola opens upward.

Find any x-intercepts of the graph.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The x-intercept(s) is(are) ____.
  (Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)
- B. There is no x-intercept.

Find any y-intercepts of the graph.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The y-intercept(s) is(are) ____.
  (Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)
- B. There is no y-intercept.

Use the graphing tool on the right to graph the parabola.

$f(x) = x^2 - 9$

$f(-3) = (-3)^2 - 9$

$f(-3) = (-3)(-3) - 9$

$f(-3) = 9 - 9$

$f(-3) = 0$

$f(0) = (0)^2 - 9$

$f(0) = (0)(0) - 9$

$f(0) = 0 - 9$

$f(0) = -9$

$f(3) = (3)^2 - 9$

$f(3) = (3)(3) - 9$

$f(3) = 9 - 9$

$f(3) = 0$

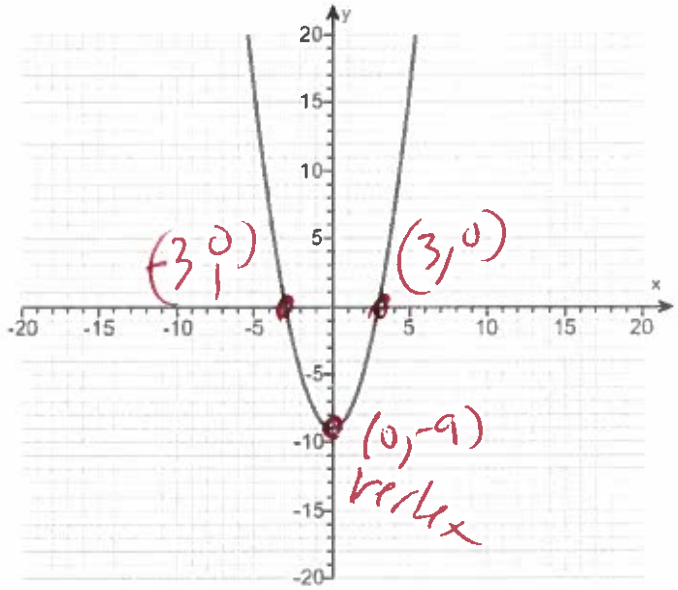
x	f(x)
-3	0
0	-9
3	0

Answers (0, − 9)

B. The parabola opens upward.

A. The x-intercept(s) is(are) **(− 3,0),(3,0)** .
(Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)

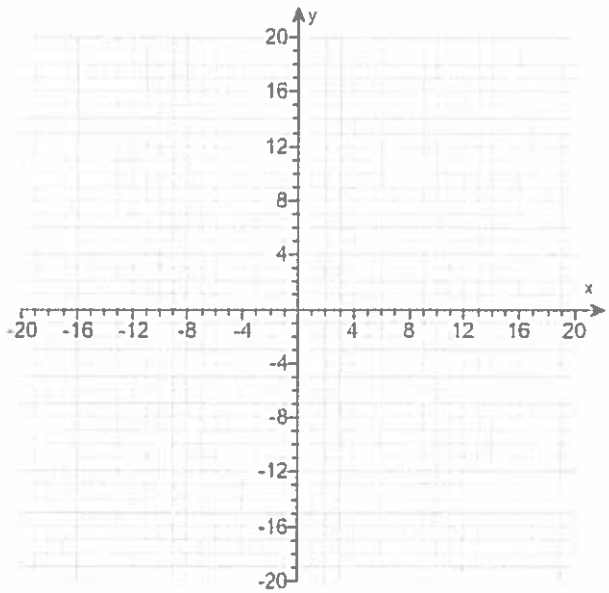
A. The y-intercept(s) is(are) **(0, − 9)** .
(Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)



140.

Find the vertex of the graph of the quadratic function. Determine whether the graph opens upward or downward, find any intercepts, and sketch the graph.

$f(x) = -15x^2 + 30x$



The vertex is [ ].
(Simplify your answer. Type an ordered pair.)

Does the graph open upward or downward?

- A. The parabola opens upward.
- B. The parabola opens downward.

Find any x-intercepts of the graph.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The x-intercept(s) is(are) [ ].
  (Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)
- B. There is no x-intercept.

Find any y-intercepts of the graph.

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. The y-intercept(s) is(are) [ ].
  (Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)
- B. There is no y-intercept.

Use the graphing tool to graph the equation.

$f(x) = -15x^2 + 30x$

$a = -15,\ b = 30,\ c = 0$

$\text{vertex} = \left(-\frac{b}{2a}, f\left(-\frac{b}{2a}\right)\right)$

$\text{vertex} = \left(-\frac{(30)}{2(-15)}, f\left(-\frac{(30)}{2(-15)}\right)\right)$

$\text{vertex} = \left(\frac{-30}{-30}, f\left(\frac{30}{-30}\right)\right)$

$\text{vertex} = (1, f(1))$

$\text{vertex} = (1, -15(1)^2 + 30(1))$

$\text{vertex} = (1, -15(1)(1) + 30(1))$

$\text{vertex} = (1, -15(1) + 30(1))$

$\text{vertex} = (1, -15 + 30)$

$\text{vertex} = (1, 15)$

x	f(x)
0	0
1	15
2	0

$f(0) = -15(0)^2 + 30(0)$

$f(0) = -15(0)(0) + 30(0)$

$f(0) = -15(0) + 30(0)$

$f(0) = 0 + 0$

$f(0) = 0$

$f(1) = -15(1)^2 + 30(1)$

$f(1) = -15(1)(1) + 30(1)$

$f(1) = -15(1) + 30(1)$

$f(1) = -15 + 30$

$f(1) = 15$

Answers (1,15)

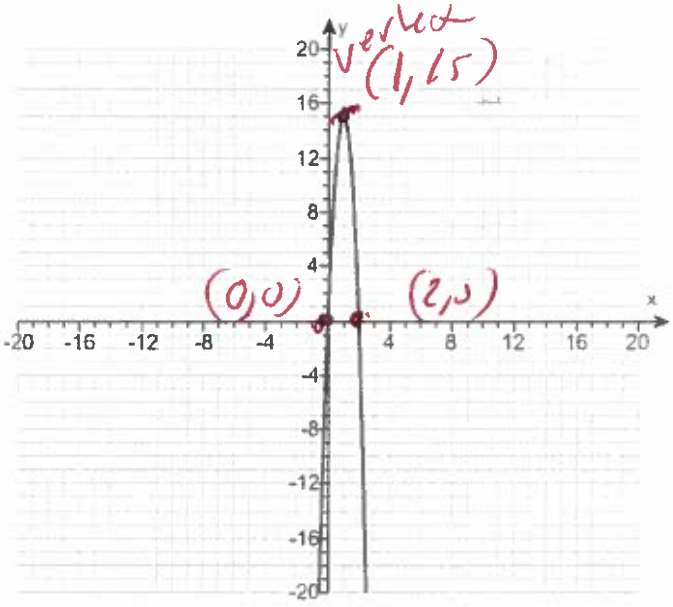
B. The parabola opens downward.

A. The x-intercept(s) is(are) (0,0),(2,0).

(Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)

A. The y-intercept(s) is(are) (0,0).

(Simplify your answer. Type an ordered pair. Use a comma to separate answers as needed.)



vertex (1,15)

$f(2) = -15(2)^2 + 30(2)$

$f(2) = -15(2)(2) + 30(2)$

$f(2) = -15(4) + 30(2)$

$f(2) = -60 + 60$

$f(2) = 0$

---

141. If a baseball is projected upward from ground level with an initial velocity of 32 feet per second, then its height is a function of time, given by $s = -16t^2 + 32t$.

What is the maximum height reached by the ball?

The maximum height reached by the ball is _____ feet.

Answer: 16

$s(t) = -16t^2 + 32t$

$a = -16, \quad b = 32, \quad c = 0$

$Vrtx = \left(\frac{-b}{2a}, s\left(\frac{-b}{2a}\right)\right)$

$Vrtx = \left(\frac{-(32)}{2(-16)}, s\left(\frac{-(32)}{2(-16)}\right)\right)$

$Vrtx = \left(\frac{-32}{-32}, s\left(\frac{-32}{-32}\right)\right)$

$Vrtx = (1, s(1))$

$Vrtx = (1, -16(1)^2 + 32(1))$

$Vrtx = (1, -16(1)(1) + 32(1))$

$Vrtx = (1, -16(1) + 32(1))$

$Vrtx = (1, -16 + 32)$

$Vrtx = (1, 16)$

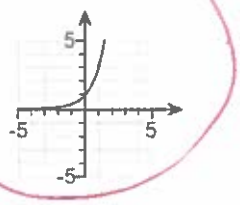
$MAX = 16$

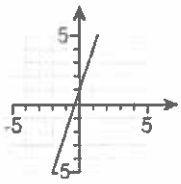
142. Graph the equation on paper, and then choose the correct graph.

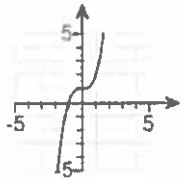
$y = 3^x$

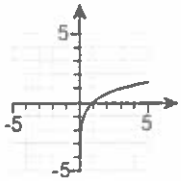
Choose the correct graph on the right.

$y = 3^0$ $y = 1$ $y = 3^1$ $y = 3$

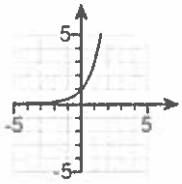
A. 

B. 

C. 

D. 

x	y
0	1
1	3

Answer: 

A.

143. Cheese production in a country is currently growing at a rate of 3% per year. The equation $y = 7.1(1.03)^x$ models the cheese production in the country from 2003 to 2009. In this equation, y is the amount of cheese produced, in billions of pounds, and x represents the number of years after 2003.

2007 − 2003 = 4

a. Estimate the total cheese production in the country in 2007.
b. Assuming this equation continues to be valid in the future, use the equation to predict the total amount of cheese produced in the country in 2016.

a. The total cheese production in the country in 2007 was about ____ billions of pounds. (Round to the nearest tenth as needed.)

2016 − 2003 = 13

b. The total cheese production in the country in 2016 will be about ____ billions of pounds. (Round to the nearest tenth as needed.)

Answers 8.0

10.4

$y = 7.1(1.03)^4$
$y = 7.99111255$
$y = 8$ round

$y = 7.1(1.03)^{13}$
$y = 10.42658937$
$y = 10.4$ round

144. Find the amount Erica owes at the end of 5 years if $5000 is loaned to her at a rate of 4% compounded monthly. Use $A = P\left(1 + \frac{r}{n}\right)^{nt}$.

$A = 5000\left(1 + \frac{.04}{12}\right)^{12(5)}$
$A = 5000(1 + .0033333)^{60}$

The amount owed is $____. (Do not round until the final answer. Then round to the nearest cent as needed.)

$A = 5000(1.0033333)^{60}$
$A = 6104.98$ round

Answer: 6104.98

145. Write the first five terms of each sequence whose general term is given.

$a_n = 4n + 5$

$a_1 =$ [ ] (Simplify your answer. Type an integer or fraction.)

$a_2 =$ [ ] (Simplify your answer. Type an integer or fraction.)

$a_3 =$ [ ] (Simplify your answer. Type an integer or fraction.)

$a_4 =$ [ ] (Simplify your answer. Type an integer or fraction.)

$a_5 =$ [ ] (Simplify your answer. Type an integer or fraction.)

Answers 9

13

17

21

25

Sequence

$a_n = 4n+5$

$a_1 = 4(1)+5 = 4+5 = 9$

$a_2 = 4(2)+5 = 8+5 = 13$

$a_3 = 4(3)+5 = 12+5 = 17$

$a_4 = 4(4)+5 = 16+5 = 21$

$a_5 = 4(5)+5 = 20+5 = 25$