

Write the following as an equation, using x for the unknown number. Then solve.

1) Four times a number added to 9 times the number equals 39. Find the number.

1) _____

A) $4x(9 + x) = 39$; 4.3

B) $4(x + 9) = 39x$; 1

C) $4x + 9x = 39$; 3

D) $4x - 9x = 39$; -4.3

Factor by grouping. Assume any variable exponents represent whole numbers.

2) $x^3 + 2x^2 + 5x + 10$

2) _____

A) $(x - 2)(x^2 - 5)$

B) $(x + 2)(x^2 + 5)$

C) $(x + 2)(x + 5)$

D) $(x + 5)(x^2 + 2)$

Solve.

3) $\sqrt{x + 1} = 7$

3) _____

A) 50

B) 48

C) 49

D) 64

Evaluate the expression without using a calculator.

4) $\log_{10} 10,000$

4) _____

A) 40

B) 4

C) $\frac{1}{10000}$

D) -4

5) $\log_5 1$

5) _____

A) 1

B) 5

C) 0

D) $\frac{1}{5}$

6) $\log_4 16$

6) _____

A) 2

B) 1

C) $\frac{1}{2}$

D) 8

Use properties of logarithms to expand the logarithmic expression as much as possible. Where possible, evaluate logarithmic expressions without using a calculator.

7) $\log_{11} \left(\frac{11}{x} \right)$

7) _____

A) $\frac{1}{x}$

B) $-\log_{11} x$

C) 11

D) $1 - \log_{11} x$

8) $\log_6 \left(\frac{x^3}{y^8} \right)$

8) _____

A) $3 \log_6 x - 8 \log_6 y$

B) $8 \log_6 y - 3 \log_6 x$

C) $\frac{3}{8} \log_6 \left(\frac{x}{y} \right)$

D) $3 \log_6 x + 8 \log_6 y$

Factor the difference of two squares.

9) $81x^2 - 64$

9) _____

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

B) $(9x - 8)^2$

C) $(9x + 8)^2$

D) prime

Find the coordinates of the vertex for the parabola defined by the given quadratic function.

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

10) _____

A) (4, 4)

B) (0, -4)

C) (4, -4)

D) (-4, 0)

Find an equation of the line that satisfies the conditions. Write the equation in standard form ($Ax + By = C$).

11) Through $(-9, 0)$; $m = -2$

11) _____

A) $-9x + y = -2$

B) $2x - y = 9$

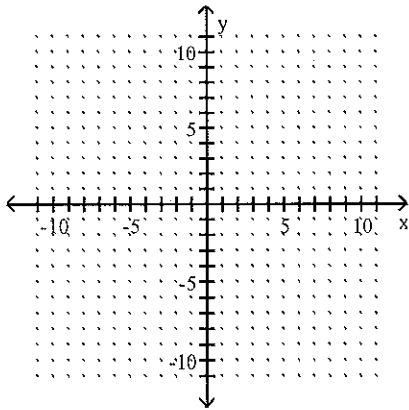
C) $2x + y = -18$

D) $9x + y = -2$

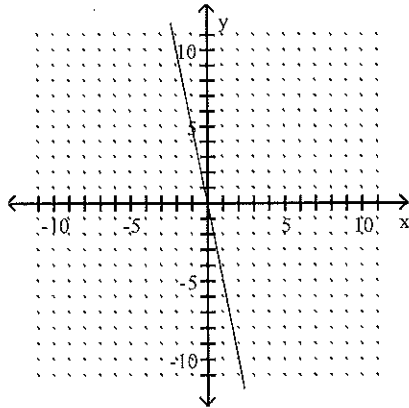
12) Graph the linear equation:

12) _____

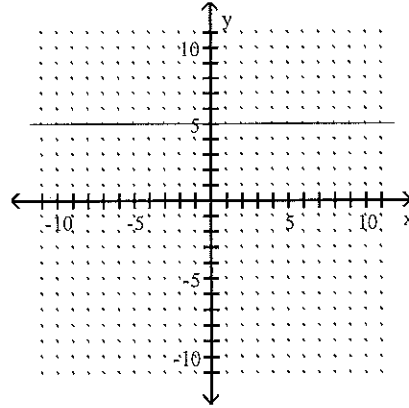
$$y = 5x$$



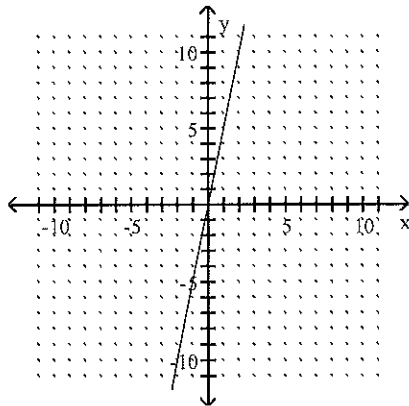
A)



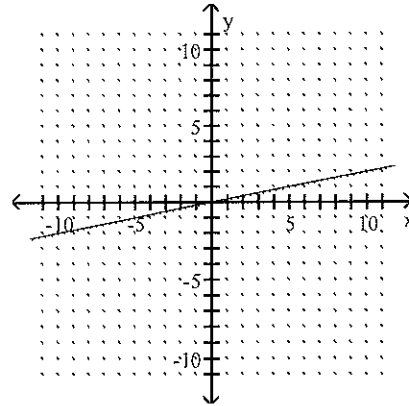
B)



C)



D)



Find the slope of the line that passes through the given points.

13) $(-8, 2)$ and $(-3, 4)$

A) $-\frac{6}{11}$

B) $\frac{5}{2}$

C) $\frac{2}{5}$

D) $-\frac{2}{5}$

13) _____

Find the product.

14) $(x - 2)(x^2 + 2x + 4)$

A) $x^3 - 8$

B) $x^3 + 8$

C) $x^3 - 4x^2 - 4x - 8$

D) $x^3 + 4x^2 + 4x - 8$

14) _____

15) $(x + 7)(x + 8)$

A) $x^2 + 15x + 15$

B) $x^2 + 56x + 15$

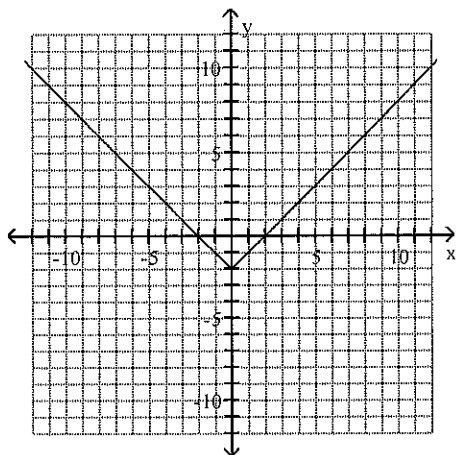
C) $x^2 + 15x + 56$

D) $x^2 + 14x + 56$

15) _____

Use the graph to determine the x- and y-intercepts.

16)



A) x-intercepts: $-2, 2$; y-intercept: 0

C) x-intercepts: $-2, 2$; y-intercept: -2

B) x-intercepts: $-2, 2$

D) y-intercept: -2

16) _____

Solve and check the linear equation.

17) $7x - 9 = -10 + 4x$

A) $\{3\}$

B) $\left\{-\frac{1}{3}\right\}$

C) $\left\{-\frac{11}{19}\right\}$

D) $\{-3\}$

17) _____

Factor the trinomial completely. If the polynomial cannot be factored, write "prime."

18) $x^2 - 5x - 24$

A) $(x - 8)(x + 3)$

B) $(x - 24)(x + 1)$

C) $(x + 8)(x - 3)$

D) prime

18) _____

19) $x^2 + x - 42$

A) prime

B) $(x - 6)(x + 7)$

C) $(x + 1)(x - 42)$

D) $(x - 7)(x + 6)$

19) _____

Solve the equation.

20) $8x - (2x - 1) = 2$

A) $-\frac{1}{10}$

B) $\frac{1}{6}$

C) $\frac{1}{10}$

D) $-\frac{1}{6}$

20) _____

21) $x^2 + 4x - 12 = 0$

A) 6, 2

B) 6, -2

C) -6, 2

D) -6, 1

21) _____

Give the domain and range of the relation.

22) $\{(3, -9), (-6, -5), (1, 3), (1, 8)\}$

A) domain = $\{1, 3, -6, -1\}$; range = $\{3, -9, -5, 8\}$

B) domain = $\{1, 3, -6\}$; range = $\{3, -9, -5, 8\}$

C) domain = $\{1, 3, -6, 11\}$; range = $\{3, -9, -5, 8\}$

D) domain = $\{3, -9, -5, 8\}$; range = $\{1, 3, -6\}$

22) _____

Solve the equation.

23) $x^2 + 17x + 72 = 0$

A) -9, -8

B) 9, 8

C) 9, -8

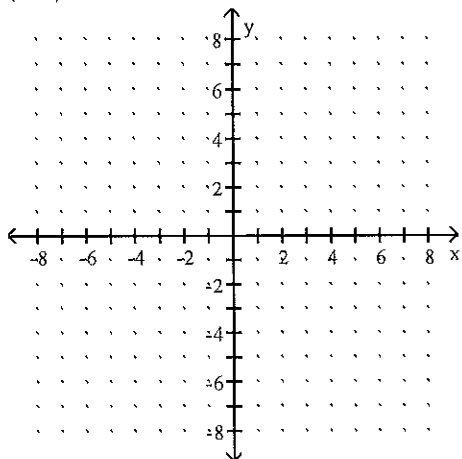
D) 72, 0

23) _____

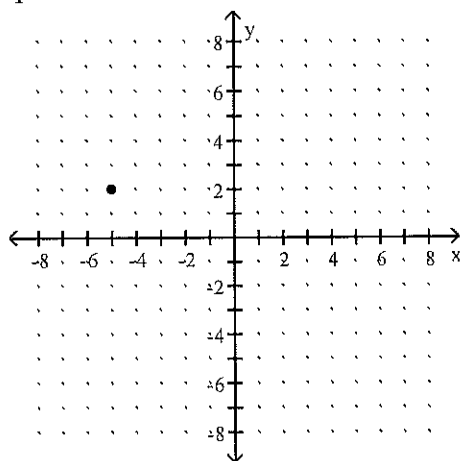
Plot the ordered pair. State in which quadrant or on which axis the point lies.

24) $(5, 2)$

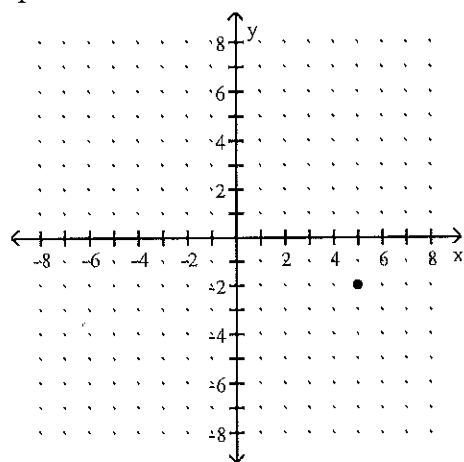
24) _____



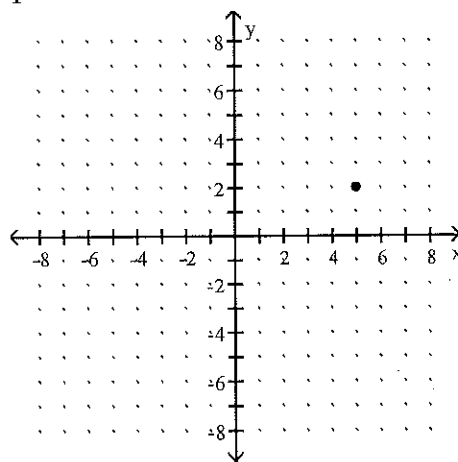
A) quadrant II



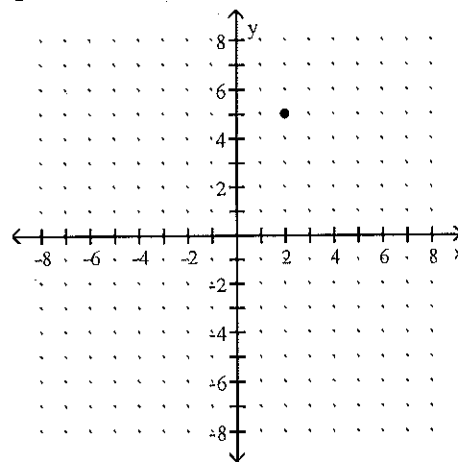
C) quadrant IV



B) quadrant I



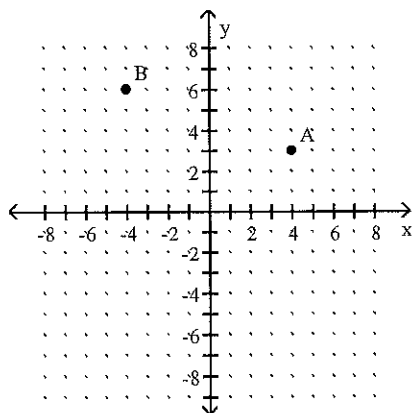
D) quadrant I



Find the x- and y-coordinates of the following labeled points.

25)

25) _____



A) A(4, 3); B(-4, 6)

B) A(4, 6); B(3, 6)

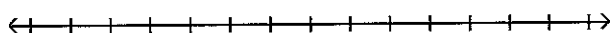
C) A(3, 24); B(6, -4)

D) A(4, 3); B(6, -4)

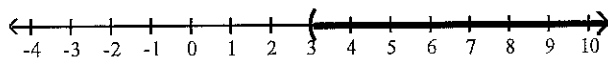
Solve the inequality. Give the solution set in both interval and graph forms.

26) $12z + 5 > 11z + 8$

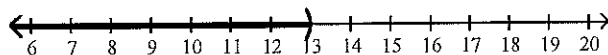
26) _____



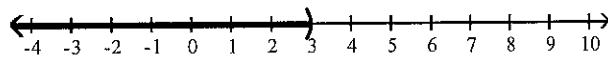
A) $(3, \infty)$



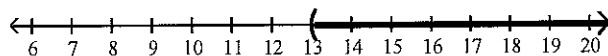
B) $(-\infty, 13)$



C) $(-\infty, 3)$



D) $(13, \infty)$



Simplify the expression by combining any like terms.

27) $(8x^6 - 6x^3 - 7x) + (3x^6 + 4x^3 - 7x)$

A) $-4x^6 + 12x^3 - 13x$

C) $11x^6 - 2x^3 - 14x$

B) $11x - 2x^6 - 14x^3$

D) $-5x^{10}$

27) _____

28) $(2x^4 - 3x^3 - 8x^2 - 1) - (6x^4 - 7x^3 + 4x^2 - 8)$

A) $-4x^4 - 10x^3 - 4x^2 - 9$

C) $8x^4 - 10x^3 - 4x^2 + 7$

B) $8x^4 - 10x^3 - 4x^2 - 9$

D) $-4x^4 + 4x^3 - 12x^2 + 7$

28) _____

Evaluate the function for the given value.

29) $f(x) = 9x^2 - 10x - 4$; for $x = 2$

A) -6

B) 8

C) 2

D) 12

29) _____

Find the horizontal asymptote, if any, of the graph of the rational function.

30) $g(x) = \frac{15x^2}{5x^2 + 1}$

A) $y = 3$

C) $y = 0$

B) $y = \frac{1}{3}$

D) no horizontal asymptote

30) _____

Factor out the GCF from the polynomial.

31) $50x - 10$

A) $10x(5 - 1)$

B) $10x(5x - 1)$

C) $10(5x - 1)$

D) $10(x - 5)$

31) _____

Find the vertical asymptotes, if any, of the graph of the rational function.

32) $h(x) = \frac{x}{x+3}$

32) _____

A) $x = 0$ and $x = -3$

B) $x = -3$

C) $x = 0$ and $x = 3$

D) no vertical asymptote

Find the slope of the line.

33) $x + y = 3$

33) _____

A) $m = 0$

B) $m = -1$

C) undefined slope

D) $m = 1$