Name: _____   **Instructor:** _____

ID Verification: _____

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Factor the polynomial completely.

1) $3y - 27 + xy - 9x$

A) $(y - 9)(3 + x)$ B) $(x - 9)(y + 3)$ C) $(x - 9)(3y + x)$ D) $(y - 9x)(3 + x)$

Find the indicated value.

2) Find $f(-2)$ when $f(x) = 5x^2 + 5x - 7$

A) 17   B) 20   C) 23   D) 3

Write an equation of the circle with the given center and radius.

3) $(-4, 6)$; 6

A) $(x + 6)^2 + (y - 4)^2 = 6$ B) $(x - 4)^2 + (y + 6)^2 = 36$
C) $(x + 4)^2 + (y - 6)^2 = 36$ D) $(x - 6)^2 + (y + 4)^2 = 6$

Perform the indicated operation.

4) $(7 + 5i) - (-3 + i)$

A) $4 + 6i$ B) $10 + 4i$ C) $10 - 4i$ D) $-10 - 4i$

Solve the absolute value equation.

5) $|5x + 9| + 6 = 9$

A) $-\dfrac{2}{3}, -\dfrac{4}{3}$ B) $-\dfrac{6}{5}, -\dfrac{12}{5}$ C) $\dfrac{6}{5}, \dfrac{12}{5}$ D) $\varnothing$

Solve the system.

    6)
$$\begin{cases} x + y + z = -1 \\ x - y + 3z = 1 \\ 5x + y + z = 15 \end{cases}$$

    A) (-2, 4, -3)   B) (4, -3, -2)   C) (-2, -3, 4)   D) $\varnothing$

Solve the equation.

    7) $\dfrac{1}{x} + \dfrac{1}{x-7} = \dfrac{x-6}{x-7}$

    A) 7, 1   B) 7, -1   C) -7, 1   D) 1

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

    8)   (2, -3), (-9, 7)

    A) $\dfrac{11}{10}$ B) $-\dfrac{11}{10}$ C) $-\dfrac{10}{11}$ D) $\dfrac{10}{11}$

Use radical notation to write the expression. Simplify if possible.

    9) $5x^{3/5}$

    A) $5\sqrt[5]{x^3}$ B) $\sqrt[3]{5x^5}$ C) $\sqrt[5]{5x^3}$ D) $\sqrt[5]{125x^3}$

Divide.

    10) $(-4x^3 - 16x^2 - 9x + 12) \div (2x + 3)$

    A) $-2x^2 - 5x + 3$ B) $-2x^2 - 5x + 3 + \dfrac{3}{2x+3}$

    C) $-2x^2 - 5x + 3 + \dfrac{6}{2x+3}$ D) $x^2 + 3 + \dfrac{-5}{2x+3}$

Rationalize the denominator and simplify.

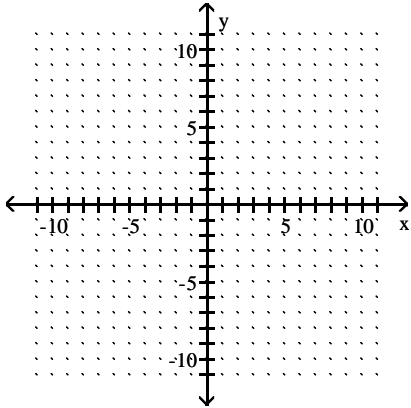   11) $\dfrac{5}{\sqrt{10}+3}$

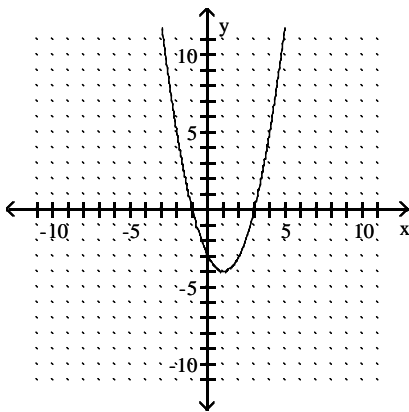   A) $5\sqrt{10}+15$ B) $5\sqrt{10}-15$ C) $\dfrac{5\sqrt{10}+15}{20}$ D) $5\sqrt{10}-3$

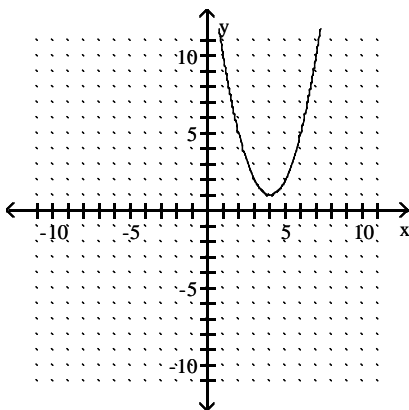**Sketch the graph of the quadratic function. Give the vertex and axis of symmetry.**
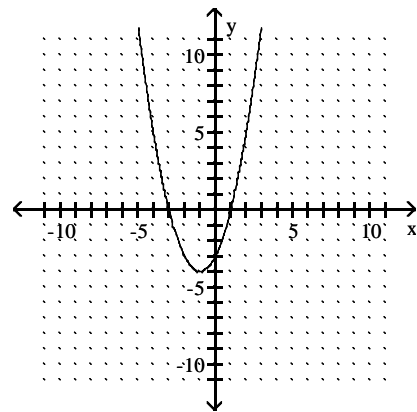
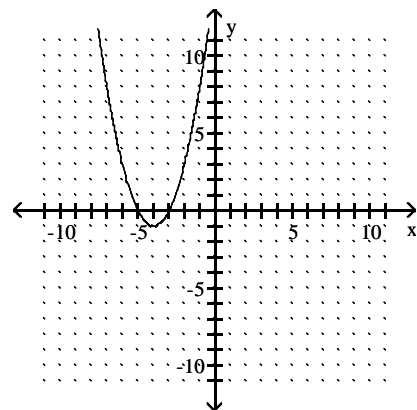12) $f(x) = (x + 1)^2 - 4$

A) vertex (1, -4); axis x = 1

B) vertex (-1, -4); axis x = -1

C) vertex (4, 1); axis x = 4

D) vertex (-4, -1); axis x = -4

Divide. Simplify completely.

13) $\dfrac{x^2 - 11x + xy - 11y}{10x^2 - 10y^2} \div \dfrac{x - 11}{6x - 6y}$

A) $\dfrac{6(x^2 - 11x + xy - 11y)}{10(x + y)(x - 11)}$

B) 1

C) $\dfrac{3}{5}$

D) $\dfrac{(x - 11)^2}{60(x - y)^2}$

3

Write an equation of the line with the given slope and containing the given point.

14) Slope 2; through (-2, -7)

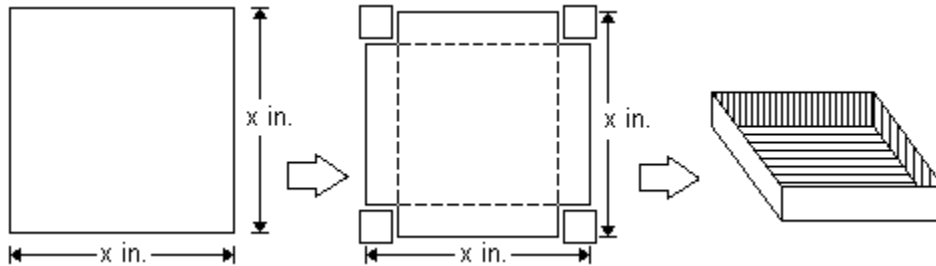   A) $y = 2x + 3$ B) $y = 2x - 3$ C) $y + 7 = x + 2$ D) $y + 7 = mx + 2$

Solve.

15) Suppose that an open box is to be made from a square sheet of cardboard by cutting out 3-inch squares from each corner as shown and then folding along the dotted lines. If the box is to have a volume of 12 cubic inches, find the original dimensions of the sheet of cardboard.
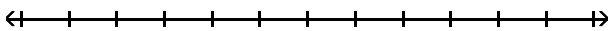

      A) $2\sqrt{3}$ in. by $2\sqrt{3}$ in.   B) 8 in. by 8 in.
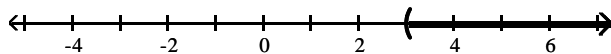
      C) $\sqrt{2}$ in. by $\sqrt{6}$ in.   D) 2 in. by 2 in.

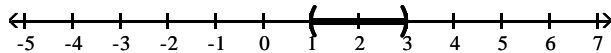**Solve the compound inequality. Graph the solution set.**
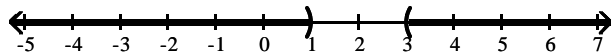
16) $-5x > -15$ and $x + 5 > 6$
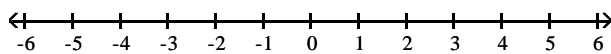

A) $(3, \infty)$

B) $(1, 3)$

C) $(-\infty, 1) \cup (3, \infty)$

D) $\varnothing$

4

Factor the polynomial completely.

17) $343x^3 - 729$

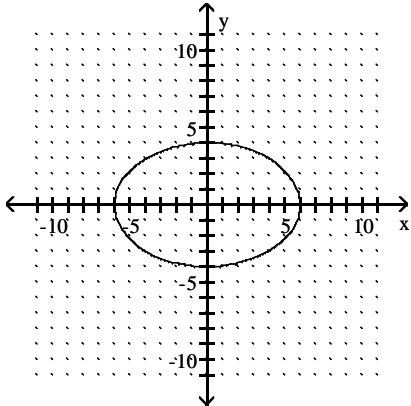   A) $(343x - 9)(x^2 + 63x + 81)$ B) $(7x + 9)(49x^2 - 63x + 81)$

    C) $(7x - 9)(49x^2 + 63x + 81)$ D) $(7x - 9)(49x^2 + 81)$

Find the domain and the range of the relation. Use the vertical line test to determine whether the graph is the graph of a function.

18)

A) domain: [-6, 6]   B) domain: [-4, 4]   C) domain: [-6, 6]   D) domain: [-4, 4]
    range: [-4, 4]   range: [-6, 6]   range: [-4, 4]   range: [-6, 6]
    function   function   not a function   not a function

Factor the polynomial completely.

19) $64x^2 + 48x + 9$

    A) $(8x + 3)(8x - 3)$ B) $(8x - 3)^2$

    C) $(64x + 1)(x + 9)$ D) $(8x + 3)^2$

Add.

20) $9\sqrt{6} + 4\sqrt{54}$

    A) $-21\sqrt{6}$ B) $-6\sqrt{6}$ C) $13\sqrt{6}$ D) $21\sqrt{6}$

Solve.

21) A painter can finish painting a house in 4 hours. Her assistant takes 6 hours to finish the same job. How long would it take for them to complete the job if they were working together?

    A) 3 hours   B) $2\dfrac{2}{5}$ hours   C) $\dfrac{5}{12}$ hours   D) 5 hours

Solve for x.

22) $\log_3 x = -2$

    A) $\dfrac{1}{8}$ B) -6   C) $\dfrac{1}{9}$ D) 1

Solve.

23) $\sqrt{4x - 8} = 5 - x$

    A) 3   B) 11   C) 3, 11   D) $\varnothing$

Simplify.

24)

$$\dfrac{\dfrac{3}{x + 5} + \dfrac{9}{x + 7}}{\dfrac{2x + 11}{x^2 + 12x + 35}}$$
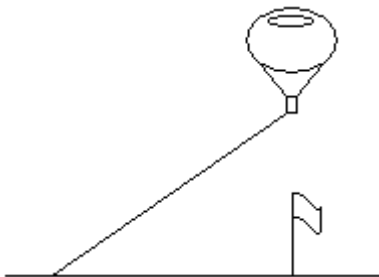
    A) 6   B) 12   C) $\dfrac{1}{6}$ D) 2x + 11

Solve.

25) A balloon is secured to rope that is staked to the ground. A breeze blows the balloon so that the rope is taut while the balloon is directly above a flag pole that is 30 feet from where the rope is staked down. Find the altitude of the balloon if the rope is 100 feet long.

    A) $10\sqrt{91}$ ft   B) $10\sqrt{109}$ ft   C) $\sqrt{70}$ ft   D) $\sqrt{910}$ ft

Solve the equation.

26) $6x^2 + 10x = -3$

A) $\dfrac{-5 - \sqrt{43}}{6}, \dfrac{-5 + \sqrt{43}}{6}$

B) $\dfrac{-10 - \sqrt{7}}{6}, \dfrac{-10 + \sqrt{7}}{6}$

C) $\dfrac{-5 - \sqrt{7}}{6}, \dfrac{-5 + \sqrt{7}}{6}$

D) $\dfrac{-5 - \sqrt{7}}{12}, \dfrac{-5 + \sqrt{7}}{12}$

Solve the formula for the specified variable.

27) $P = 2L + 2W$ for W

A) $W = \dfrac{P - L}{2}$ B) $W = P - L$ C) $W = \dfrac{P - 2L}{2}$ D) $W = d - 2L$

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

28) Through (8, 3); parallel to $f(x) = 5x - 5$

A) $f(x) = 5x - 37$ B) $f(x) = 5x + 3$ C) $f(x) = 5x + 43$ D) $f(x) = -5x - 37$

Solve the equation.

29) $3(5x + 4) + 13 = 12x - 2$

A) 9   B) -9   C) -27   D) -81

30) $2^{(12 - 4x)} = 16$

A) 3   B) 2   C) 1   D) -2

7

1) A
2) D
3) C
4) B
5) B
6) B
7) D
8) C
9) A
10) B
11) B
12) B
13) C
14) B
15) B
16) B
17) C
18) C
19) D
20) D
21) B
22) C
23) A
24) A
25) A
26) C
27) C
28) A
29) B
30) B