MATH0200 **online** PLACEMENT TEST 182 QUESTIONS 11–08–13 Fall 2013

elementary and intermediate Algebra

Warm–up

Name_____atfm0303mk2810yes

website **www.alvarezmathhelp.com**

PROGRAMS ALVAREZLAB (SAVE AND EXTRACT TO YOUR COMPUTER)
VIDEOS (ON DEMAND)
INTERACTMATH (MCKENNA AND KIRK BEGINNING AND INTERMEDIATE ALG)
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Subtract.

1) 40 – (–54)   1) _____
       A) –14   B) 94   C) 14   D) –94

   Objective: (1.3) Subtract Real Numbers

2) (–8) – (–22)   2) _____
       A) –14   B) 30   C) 14   D) –30

   Objective: (1.3) Subtract Real Numbers

Perform the indicated operations.

3) 17 – (–19) + 14 + (–18)   3) _____
       A) 32   B) –4   C) 30   D) –30

   Objective: (1.3) Add/Subtract More Than Two Real Numbers

Evaluate.

4) -10^2 4) _____
       A) –20   B) –1000   C) –100   D) –1024

   Objective: (1.5) Evaluate Exponential Expression

5) $(-6)^2$ 5) _____
       A) –36   B) –12   C) 12   D) 36

   Objective: (1.5) Evaluate Exponential Expression

Simplify using the order of operations.

6) 8 + 2(–4 – 1)   6) _____
       A) 2   B) 14   C) –2   D) –1

   Objective: (1.5) Simplify Using Order of Operations

Evaluate the following algebraic expression using the indicated values.

7) $\dfrac{8(a - b)}{-9c - d}$ when a = 7, b = 0, c = –9, d = 82   7) _____
       A) 28   B) –56   C) – 28   D) 56

   Objective: (1.5) Evaluate Algebraic Expression Using Indicated Values

Simplify by combining like terms.

8) –9x – 3x   8) _____
       A) –12x   B) –12 + x   C) –6x   D) 27x

   Objective: (1.5) Simplify by Combining Like Terms

9) $7a - 2a + 5b$

    A) $-5a + 5b$ B) $9a + 5b$ C) $10a$ D) $5a + 5b$

9) _____

10) $7x + 6 + 3x - x + 4$

    A) $11x + 10$ B) $9x + 10$ C) $10x + 10$ D) $10x - 10$

10) _____

11) $3x^2 - 9x - 4 + 5x - 6 + 9x^2$

    A) $5x^2 + 8x - 15$ B) $12x^2 - 4x - 10$ C) $-2x^3$ D) $12x^4 - 4x^2 - 10$

11) _____

Use the Distributive Property to remove parentheses, and then combine like terms.

12) $9(y + 8) - 6$

    A) $9y + 18$ B) $9y + 2$ C) $9y + 66$ D) $17y - 6$

12) _____

13) $9x - (7 - 3x)$

    A) $6x - 7$ B) $12x + 7$ C) $12x - 7$ D) $9x - 10$

13) _____

14) $4x + 8 - 2(-4x - 8)$

    A) $-8x - 16$ B) $-12x - 24$ C) $12x + 24$ D) $8x + 16$

14) _____

15) $-4(9r + 7) + 6(3r + 5)$

    A) $-18r + 2$ B) $-18r + 7$ C) $5r + 3$ D) $-64r$

15) _____

Solve the linear equation and check the solution.

16) $13(x - 52) = 26$

    A) $\{52\}$ B) $\{26\}$ C) $\{50\}$ D) $\{54\}$

16) _____

17) $6x - (5x - 1) = 2$

    A) $\{1\}$ B) $\left\{-\dfrac{1}{11}\right\}$ C) $\{-1\}$ D) $\left\{\dfrac{1}{11}\right\}$

17) _____

18) $-7x + 3(2x - 4) = -9 - 4x$

    A) $\left\{\dfrac{21}{5}\right\}$ B) $\{1\}$ C) $\{-1\}$ D) $\{-7\}$

18) _____

19) $-7q + 1.0 = -24.5 - 1.9q$

    A) $\{5\}$ B) $\{3.9\}$ C) $\{-31\}$ D) $\{3.6\}$

19) _____

20) $\frac{1}{2}x + \frac{6}{5} = \frac{2}{5}x$

20) _____

    A) {–16}   B) {16}   C) {12}   D) {–12}

21) $\frac{7}{3} - \frac{x}{3} = \frac{x}{4}$

21) _____

    A) {7}   B) {4}   C) {–4}   D) $\left\{\frac{28}{5}\right\}$

22) $\frac{r + 6}{5} = \frac{r + 8}{7}$

22) _____

    A) {1}   B) {2}   C) {–2}   D) {–1}

23) $\frac{17x}{16} + \frac{x}{16} = 6x + \frac{1}{8} + \frac{15}{16}x$

23) _____

    A) $\left\{-\frac{2}{93}\right\}$ B) $\left\{\frac{1}{93}\right\}$ C) $\left\{-\frac{1}{93}\right\}$ D) $\left\{\frac{2}{99}\right\}$

Solve for the indicated variable.

24) $A = P(1 + rt)$, for t

24) _____

    A) $t = \frac{Pr}{A - P}$ B) $t = \frac{A}{r}$ C) $t = \frac{P - A}{Pr}$ D) $t = \frac{A - P}{Pr}$

25) $A = \frac{1}{2}h(a + b)$, for a

25) _____

    A) $a = \frac{A - hb}{2h}$ B) $a = \frac{hb - 2A}{h}$ C) $a = \frac{2Ab - h}{h}$ D) $a = \frac{2A - hb}{h}$

Solve the problem by utilizing the 4P's: Prepare, Plan, Process, and Ponder.

26) Solve the formula for the volume of a right circular cone, $V = \frac{1}{3}\pi r^2 h$, for the height (h). Determine 26) _____

the height of a right circular cone with a radius of 2 meters and a volume of 16π cubic meters.

h (height)

r (radius)
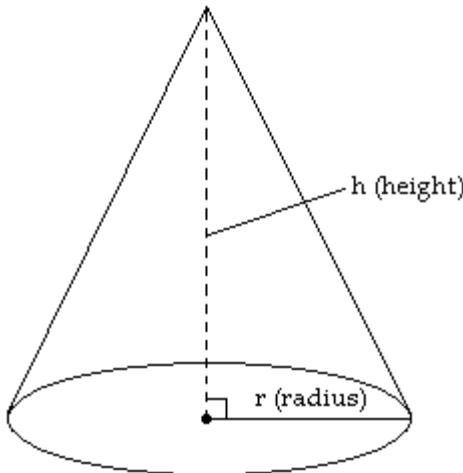
A) $h = \frac{3V}{\pi r^2}; h = 24$ m
B) $h = \frac{3V}{\pi r^2}; h = 12$ m

C) $h = \frac{3V}{\pi r^2}; h = 8$ m
D) $h = \frac{3V}{\pi r^2}; h = 4$ m

Objective: (2.3) Solve 4Ps Application

Solve for the indicated variable.

27) $-16 = -9p + 3q$, for p 27) _____

A) $p = \frac{9 - 16q}{3}$
B) $p = \frac{16 + 3q}{9}$
C) $p = -16 - 3q$
D) $p = \frac{16 - 3q}{-9}$

Objective: (2.3) Solve Challenge Problems

28) $\frac{x}{a} + \frac{y}{b} = 1$, for x 28) _____

A) $x = a\left(1 - \frac{y}{b}\right)$
B) $x = a\left(\frac{y}{b} - 1\right)$
C) $x = b\left(1 - \frac{y}{a}\right)$
D) $x = a\left(1 + \frac{y}{b}\right)$

Objective: (2.3) Solve Challenge Problems

29) $ax + by = c$, for x 29) _____

A) $x = \frac{c - ay}{b}$
B) $x = \frac{c + ay}{b}$
C) $x = \frac{c - by}{a}$
D) $x = \frac{c + by}{a}$

Objective: (2.3) Solve Challenge Problems

Solve the linear inequality and graph the solution set. State the solution using interval notation.

30) $4x - 4 \geq 20$
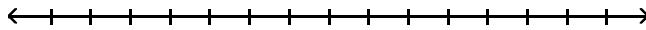
A) $[4, \infty)$
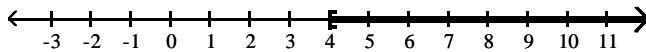

B) $[6, \infty)$
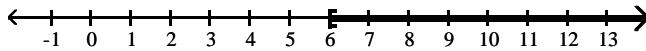
C) $(-\infty, 4]$
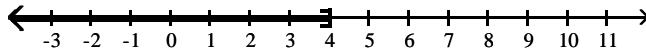
D) $(-\infty, 6]$
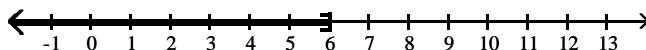
Objective: (2.4) Solve and Graph Linear Inequality

31) $36 - 6x \geq -6$
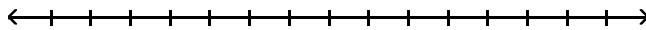
A) $(-\infty, -5]$
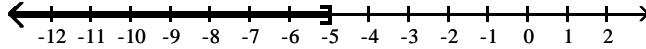
B) $[-5, \infty)$
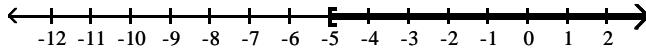
C) $[7, \infty)$
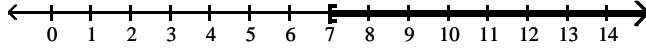
D) $(-\infty, 7]$
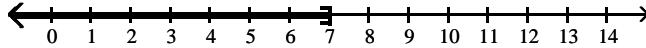
Objective: (2.4) Solve and Graph Linear Inequality

Solve the linear inequality and state the solution set using interval notation, if applicable.

32) $\dfrac{x}{2} \geq 3 + \dfrac{x}{8}$

A) $[8, \infty)$ B) $[-8, \infty)$ C) $(8, \infty)$ D) $(-\infty, 8]$

Objective: (2.4) Solve Linear Inequality

Solve the inequality for x. Write the answer using interval notation.

33) $\dfrac{x + 7}{6} - \dfrac{5}{48} > \dfrac{x + 3}{8}$

33) _____

    A) $\left(-\dfrac{33}{2}, \infty\right)$ B) $\left(-\infty, -\dfrac{33}{2}\right)$ C) $\left(-\infty, -\dfrac{43}{14}\right)$ D) $\left(\dfrac{79}{2}, \infty\right)$

Solve the double inequality for x. State the solution using interval notation.

34) $13 \le 3x + 1 \le 19$

34) _____

    A) [4, 6]   B) [−6, −4]   C) (4, 6)   D) (−6, −4)

Solve the absolute value equation and write the solution set using set notation.

35) $|r - 2| = 5$

35) _____

    A) {−7}   B) {−3, 7}   C) { }   D) {3, 7}

Solve the absolute value inequality. Graph the solution set, then write the answer using interval notation.

36) $|x - 9| < 16$

36) _____

    A) (−∞, 25)

    B) (−25, 7)

    C) (−7, 25)

    D) (−∞, −7)

Solve the absolute value equation or inequality. State the solution using set notation or interval notation, whichever is appropriate.

37) $|x + 6| > 16$

A) $(-10, 22)$

B) $(10, \infty)$
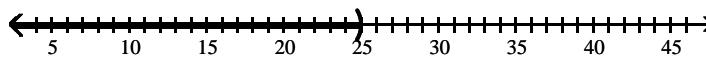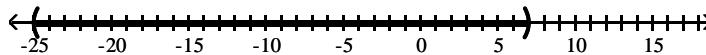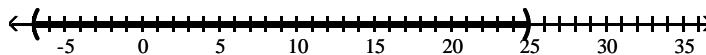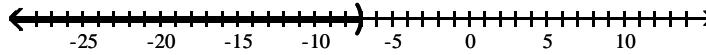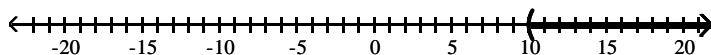
C) $(-\infty, -22) \cup (10, \infty)$
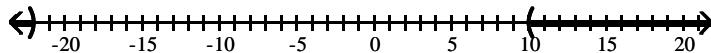
D) $(-22, 10)$
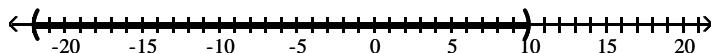
Objective: (2.6) Solve and Graph Absolute Value Inequality (>, ≥)

Determine if the ordered pair is a solution to the equation.

38) $(3, 5)$ $5x + y = 20$

A) yes   B) no

Objective: (3.1) Determine if Ordered Pair Is Solution to Equation

Use the intercept method to graph the solutions of the linear equation.

39) $2x - 3y = 6$


A)

B)

37) _____

38) _____

39) _____

7
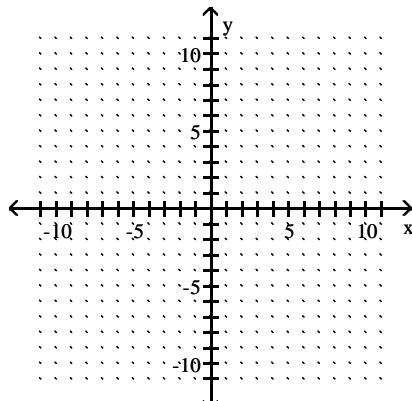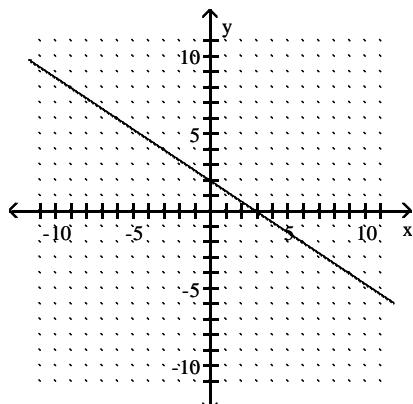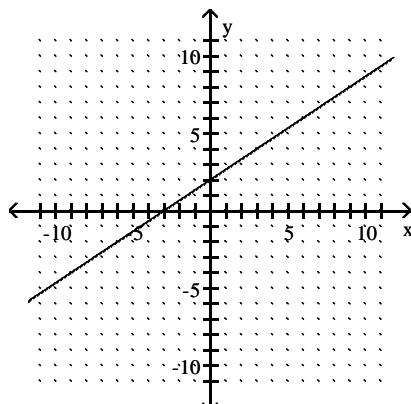
C)
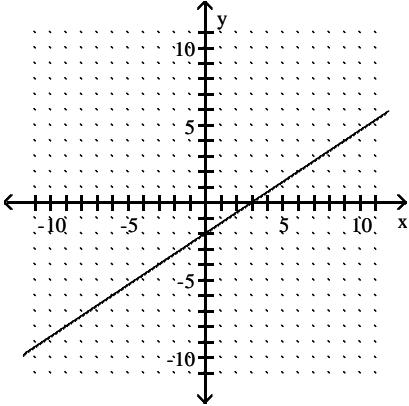
D)
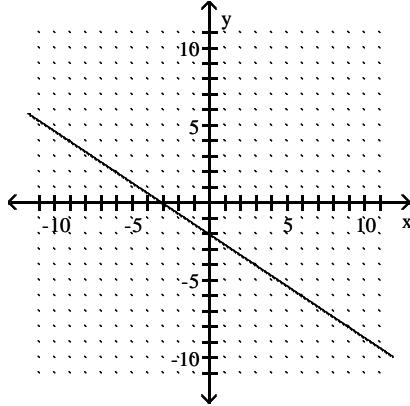
Objective: (3.2) Graph Linear Equation Using Intercept Method

Find the slope of the straight line through the two solution points.

40) (8, 3) and (−4, 4)   40) _____

A) $m = -\dfrac{5}{8}$ B) $m = -12$ C) $m = -\dfrac{1}{12}$ D) $m = -\dfrac{8}{5}$

Objective: (3.3) Find Slope of Line Given Two Points

Find the slope and the y–intercept by using the slope–intercept form of the equation of the line. If necessary, solve for y first.

41) $2x - 3y = -8$ 41) _____

A) $m = \dfrac{3}{2}, \left(0, -4\right)$ B) $m = \dfrac{2}{3}, \left(0, \dfrac{8}{3}\right)$

C) $m = -\dfrac{2}{3}, \left(0, \dfrac{8}{3}\right)$ D) $m = -\dfrac{2}{3}, \left(0, -\dfrac{8}{3}\right)$

Objective: (3.3) Find Slope and y–Intercept Given Equation

**Graph the solutions of the linear equation by using the slope and y–intercept.**

42) $y = 2x - 6$ 42) _____

8

A)

B)

C)

D)

Write the equation of the line having the given slope and passing through the given point.

43) m = 3, (–3, 6)

43) _____

    A) x = 3y – 15   B) y = 3x – 15   C) x = 3y + 15   D) y = 3x + 15

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

44) y = 6x – 8

44) _____

$y = -\dfrac{1}{6}x - 1$

    A) parallel   B) perpendicular   C) neither

45) y = 9x – 6

45) _____

    y = 9x + 4

    A) perpendicular   B) parallel   C) neither

46) y = 5x – 4

46) _____

    y = –5x – 8

    A) parallel   B) perpendicular   C) neither

Solve the system of linear equations using the Substitution Method.

47) $\begin{cases} x + y = 10 \\ 3x + 5y = 16 \end{cases}$

    A) {(17, –7)}   B) {(x, y)| x + y = 10}

    C) { }   D) {(3, 7)}

47) _____

48) $\begin{cases} x + y = 16 \\ y = 3x \end{cases}$

    A) { }   B) {(–4, –12)}

    C) {(4, 12)}   D) {(x, y)| x + y = 16}

48) _____

49) $\begin{cases} 8x - 4y = 8 \\ 2x - y = 5 \end{cases}$

    A) {(4, –3)}   B) {(x, y)| 8x - 4y = 8}

    C) {(–4, 13)}   D) { }

49) _____

Solve the system of linear equations using the Elimination Method.

50) $\begin{cases} x - y = 7 \\ x + y = 5 \end{cases}$

    A) { }   B) {(–6, –13)}

    C) {(x, y)| x - y = 7}   D) {(6, –1)}

50) _____

51) $\begin{cases} 0.03x - 0.1y = 1 \\ -0.2x + 0.02y = 58 \end{cases}$

    A) {(300, 80)}   B) {(–300, –100)}

    C) {(x, y)| 0.03x - 0.1y = 1}   D) { }

51) _____

Subtract. Write the difference in descending powers of the variable.

52) $(8x^2 - 5x + 20) - (3x^2 + 5x - 40)$

    A) $5x^2 + 10x - 60$ B) $5x^2 - 10x - 20$ C) $5x^2 + 10x + 60$ D) $5x^2 - 10x + 60$

52) _____

Evaluate the polynomial with the indicated value for the variable.

53) $-2x^3 - 5x^2 - x - 46$ for $x = -2$

    A) –58   B) –18   C) –48   D) –60

53) _____

Multiply the monomials.

54) $(-4x^3y^4)(-5x^2y^2)$

    A) $20x^6y^5$ B) $20x^5y^6$ C) $20xy^6$ D) $20xy^5$

54) _____

Multiply.

55) $9x(-10x - 2)$

    A) $-10x^2 - 18x$ B) $-108x^2$ C) $-90x^2 - 2x$ D) $-90x^2 - 18x$

    Objective: (5.4) Mulitply Monomial by Polynomial

55) _____

Multiply using the Distributive Property.

56) $(y + 4)(y + 7)$

    A) $2y^2 + 28$ B) $2y + 28$ C) $y^2 + 11y + 11$ D) $y^2 + 11y + 28$

    Objective: (5.4) Multiply Binomial by Binomial

56) _____

57) $(2x - 10)(x - 12)$

    A) $x^2 + 120x - 34$ B) $2x^2 + 31x + 120$ C) $2x^2 - 34x + 120$ D) $x^2 - 34x + 31$

    Objective: (5.4) Multiply Binomial by Binomial

57) _____

58) $(5x + 7)(4x - 10)$

    A) $20x^2 - 22x - 22$ B) $9x^2 - 22x - 22$ C) $20x^2 - 22x - 70$ D) $9x^2 - 22x - 70$

    Objective: (5.4) Multiply Binomial by Binomial

58) _____

59) $(x - 11y)(5x + 6y)$

    A) $5x^2 - 49xy - 66y^2$ B) $5x^2 - 49xy - 49y^2$

    C) $x^2 - 49xy - 49y^2$ D) $x^2 - 49xy - 66y^2$

    Objective: (5.4) Multiply Binomial by Binomial

59) _____

Multiply.

60) $(x + 1)(x^2 - x + 1)$

    A) $x^3 - 2x^2 - 2x - 1$ B) $x^3 + 1$

    C) $x^3 + 2x^2 + 2x + 1$ D) $x^3 - 1$

    Objective: (5.4) Multiply Polynomial by Polynomial

60) _____

Solve the problem by utilizing the 4P's: Prepare, Plan, Process, and Ponder.

61) Use the figure to: 61) _____

    a. Find the exact area of the shaded region leaving π in the answer.

    b. Find the approximate area (in square yards) by letting $x = 5$ yards and $\pi \approx 3.14$

2x + 4
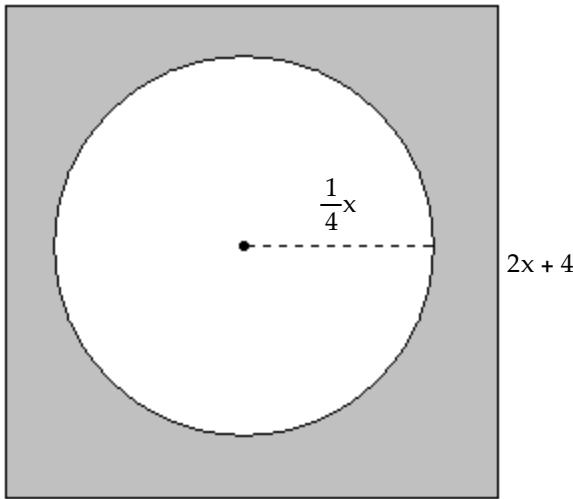
A) a. $\left(-\dfrac{(64 + \pi)}{16}x^2 - 16x - 16\right)$ units^2

    b. -191.09 yd^2

C) a. $\left(\dfrac{(64 + \pi)}{16}x^2 + 16x + 16\right)$ units^2

    b. 200.91 yd^2

B) a. $\left(\dfrac{(64 - \pi)}{16}x^2 + 16x + 16\right)$ units^2

    b. 191.09 yd^2

D) a. $\left(\dfrac{(4 - \pi)}{16}x^2 + 16x + 16\right)$ units^2

    b. 97.34 yd^2

Objective: (5.4) Solve 4Ps Application

62) Use the figures to:

a. Find the areas of the two triangles and write the answers as polynomials. Recall that the area of a triangle is given by $A = \frac{1}{2}bh$.

b. If x = 8 meters, find the numeric values for each area in square meters.

$5x^2 - 4x + 3$ $x^2 - 3x + 8$
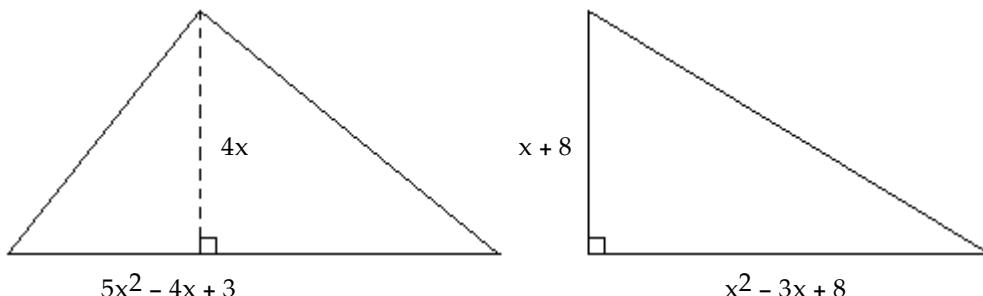
A) a. $20x^3 - 16x^2 + 12x$ units^2; $x^3 + 5x^2 - 16x + 64$ units^2

   b. $9312 m^2$; $768 m^2$

B) a. $10x^3 - 8x^2 - 6x$ units^2; $\frac{1}{2}x^3 + \frac{5}{2}x^2 - 8x - 32$ units^2

   b. $4560 m^2$; $640 m^2$

C) a. $10x^3 + 8x^2 + 6x$ units^2; $\frac{1}{2}x^3 + \frac{5}{2}x^2 + 8x + 32$ units^2

   b. $5680 m^2$; $512 m^2$

D) a. $10x^3 - 8x^2 + 6x$ units^2; $\frac{1}{2}x^3 + \frac{5}{2}x^2 - 8x + 32$ units^2

   b. $4656 m^2$; $384 m^2$

Objective: (5.4) Solve 4Ps Application

Multiply using the FOIL method.

63) (a + 5)(a + 5)

   A) $a^2 + 10a + 10$ B) $2a + 25$ C) $2a^2 + 25$ D) $a^2 + 10a + 25$

   Objective: (5.5) Multiply Two Binomials Using FOIL Method

64) $(m - a)^2$

   A) $m^2 + 2ma + a^2$ B) $m^2 - 2ma + a^2$ C) $m^2 - ma + a^2$ D) $m^2 - 2ma - a^2$

   Objective: (5.5) Multiply Two Binomials Using FOIL Method

Square using special products.

65) $(x + 3)^2$

   A) $x^2 + 6x + 9$ B) $9x^2 + 6x + 9$ C) $x^2 + 9$ D) $x + 9$

   Objective: (5.5) Square Binomial

66) $(9a - 11)^2$

   A) $9a^2 + 121$ B) $81a^2 + 121$

   C) $81a^2 - 198a + 121$ D) $9a^2 - 198a + 121$

   Objective: (5.5) Square Binomial

67) $(4b + 5)^2$

    A) $16b^2 + 40b + 25$ B) $4b^2 + 40b + 25$

    C) $4b^2 + 25$ D) $16b^2 + 25$

Objective: (5.5) Square Binomial

67) _____

68) $(4x - 11y)^2$

    A) $16x^2 - 88xy + 121y^2$ B) $4x^2 - 88xy + 121y^2$

    C) $4x^2 + 121y^2$ D) $16x^2 + 121y^2$

Objective: (5.5) Square Binomial

68) _____

Use the special product of a sum and difference of two terms to multiply the binomials.

69) $(x + 5)(x - 5)$

    A) $x^2 + 10x - 25$ B) $x^2 - 25$ C) $x^2 - 10$ D) $x^2 - 10x - 25$

Objective: (5.5) Multiply Sum and Difference of Two Terms

69) _____

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

    A) $x^2 - 16y^2$ B) $x^2 - 64y^2$

    C) $x^2 - 16xy - 64y^2$ D) $x^2 + 16xy - 64y^2$

Objective: (5.5) Multiply Sum and Difference of Two Terms

70) _____

71) $(10a + 3b)(10a - 3b)$

    A) $100a^2 - 60ab - 9b^2$ B) $10a^2 - 3b^2$

    C) $100a^2 + 60ab - 9b^2$ D) $100a^2 - 9b^2$

Objective: (5.5) Multiply Sum and Difference of Two Terms

71) _____

Find the area of the geometric figure using special products.

72)

3x + 3
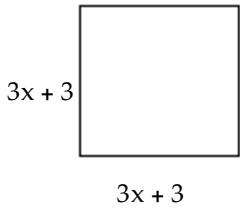
    A) $9x^2 + 9$ B) $6x^2 + 18x + 6$ C) $9x^2 + 9x + 9$ D) $9x^2 + 18x + 9$

Objective: (5.5) Solve Application

72) _____

73) 73) _____

$6x - 1$

$6x - 1$
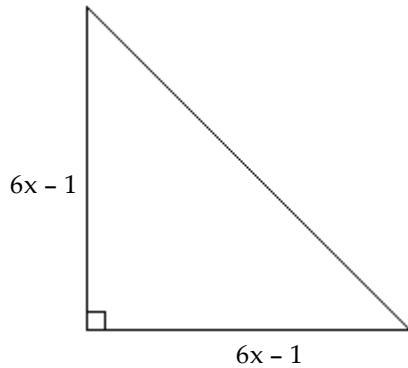
   A) $18x^2 - 6x + \dfrac{1}{2}$ B) $36x^2 - 12x - 1$ C) $18x^2 + 6x - \dfrac{1}{2}$ D) $36x^2 - 12x + 1$

Objective: (5.5) Solve Application

Divide. Write answer in lowest terms using positive powers only.

74) $\dfrac{-42x^9y^{13}z^6}{7x^6y^8z^5}$ 74) _____

   A) $-6x^2y^4z$ B) x^3y^5z C) $-6x^3y^5z$ D) $-6x^3y^5$

Objective: (5.6) Divide Using Exponent Rules

Divide. Do not use long division.

75) $\dfrac{12a^3 - 9a^5 + 15a}{3a}$ 75) _____

   A) $4a^2 - 3a^4 - 5$ B) $4a^2 - 9a^5 + 15a$ C) $12a^3 - 3a^5 + 5$ D) $4a^2 - 3a^4 + 5$

Objective: (5.6) Divide Polynomial by Monomial

Divide using long division.

76) $(x^2 + 7x - 18) \div (x + 9)$ 76) _____

   A) $x^2 - 2$ B) $x - 2$ C) $x^2 + 8x - 9$ D) $x + 2$

Objective: (5.6) Divide Using Long Division (No Remainder)

Factor out the GCF using the Distributive Property.

77) $3x^2y^6 + 15x^2y^5$ 77) _____

   A) $3x^5y^2(y + 5)$ B) $y + 5$ C) $3x^2y^5(y + 5)$ D) $x^2y^5(3y + 5)$

Objective: (6.1) Factor Out GCF

78) $5x(3x + 4) - 4(3x + 4)$ 78) _____

   A) $(5x - 4)(3x + 4)$ B) $(15x + 4)(x - 4)$ C) $(15x - 4)(x + 4)$ D) $(5x + 4)(3x - 4)$

Objective: (6.1) Factor Out GCF (Binomial Factor)

Factor by grouping.

79) $x^2 + 5x + xy + 5y$ 79) _____

   A) $(x - 5)(x + y)$ B) $(x + 5)(x + y)$ C) $(x + 5)(x - y)$ D) $(x - 5)(x - y)$

Objective: (6.1) Factor by Grouping

80) $yx - 9x - 5y + 45$ 80) _____
    A) $(y - 9)(x - 5)$ B) $(y + 9)(x + 5)$ C) $(y + 9)(x - 5)$ D) $(y - 9)(x + 5)$

Objective: (6.1) Factor by Grouping

Factor, if possible, using the difference or sum of squares. If a polynomial is not factorable, write "prime."

81) $16k^2 - 81m^2$ 81) _____
    A) $(4k + 9m)^2$ B) prime
    C) $(4k - 9m)^2$ D) $(4k + 9m)(4k - 9m)$

Objective: (6.2) Factor Sum or Difference of Squares

Factor using the sum or difference of cubes.

82) $x^3 - 512y^3$ 82) _____
    A) $(x + 8y)(x^2 - 8xy + 64y^2)$ B) $(x - 8y)(x^2 + 8xy + 64y^2)$
    C) $(x + 512y)(x^2 + y^2)$ D) $(x - 8y)(x^2 + 64y^2)$

Objective: (6.2) Factor Sum or Difference of Cubes

Using the general factoring strategy, factor completely. If a polynomial is not factorable, write "prime."

83) $4x^2 - 196$ 83) _____
    A) $4(x - 7)^2$ B) $(4x + 28)(x - 7)$ C) $4(x + 7)(x - 7)$ D) $(4x + 7)(x - 28)$

Objective: (6.2) Factor Using General Strategy

84) $\dfrac{25}{121}m^2 - \dfrac{9}{4}$ 84) _____

    A) $\left(\dfrac{5}{11}m + \dfrac{3}{2}\right)^2$ B) $\left(\dfrac{5}{11}m + \dfrac{3}{2}\right)\left(\dfrac{5}{11}m - \dfrac{3}{2}\right)$

    C) $\left(\dfrac{5}{11}m - \dfrac{3}{2}\right)^2$ D) prime

Objective: (6.2) Solve Challenge Problem

Factor the trinomial using the AC Method. If a trinomial is not factorable, write "prime."

85) $4x^2 + 12x + 9$ 85) _____
    A) $(4x + 3)(x + 3)$ B) $(2x - 3)(2x - 3)$ C) prime   D) $(2x + 3)(2x + 3)$

Objective: (6.3) Factor Using AC Method

86) $15x^2 - 14x - 8$ 86) _____
    A) $(3x - 4)(5x + 2)$ B) $(x - 4)(15x + 2)$ C) $(3x + 4)(5x - 2)$ D) $(5x - 4)(3x + 2)$

Objective: (6.3) Factor Using AC Method

Factor the trinomial using the Educated Guess–and–Test Method. If a trinomial is not factorable, write "prime."

87) $15x^2 + 16xy + 4y^2$ 87) _____
    A) $(3x + 2y)(5x + 2y)$ B) $(3x - 2y)(5x - 2y)$
    C) $(15x + y)(x + 4y)$ D) $(15x + 2y)(x + 2y)$

Objective: (6.3) Factor Using Educated Guess–and–Test Method

Factor the trinomial using the Modified Guess–and–Test Method. If the trinomial is not factorable, write "prime."

88) $x^2 - x - 30$ 88) _____
    A) prime   B) $(x + 5)(x - 6)$ C) $(x + 1)(x - 30)$ D) $(x + 6)(x - 5)$

89) $x^2 + 7x - 44$ 89) _____
    A) $(x + 11)(x - 4)$ B) $(x - 11)(x + 4)$ C) prime   D) $(x - 11)(x + 1)$

90) $u^2 - 2uv - 48v^2$ 90) _____
    A) $(u - 6v)(u + v)$ B) $(u + 6v)(u - 8v)$ C) $(u - 6v)(u + 8v)$ D) $(u - v)(u + 8v)$

Determine if the trinomial is a perfect square trinomial. If it is, factor it. If it is not, write "prime."

91) $x^2 + 16x + 64$ 91) _____
    A) $(x + 8)^2$ B) $(x + 8)(x - 8)$ C) $(x - 8)^2$ D) prime

92) $b^2 - 36b + 324$ 92) _____
    A) $(b + 18)(b - 18)$ B) $(b - 18)^2$ C) prime   D) $(b + 18)^2$

93) $64x^2 - 48xy + 9y^2$ 93) _____
    A) prime   B) $(8x - y)^2$ C) $(8x - 3y)^2$ D) $(8x + 3y)^2$

Factor the trinomial using the general factoring strategy. If a trinomial is not factorable, write "prime."

94) $5x^2 - 5x - 30$ 94) _____
    A) $(5x + 10)(x - 3)$ B) prime   C) $5(x - 2)(x + 3)$ D) $5(x + 2)(x - 3)$

95) $y^3 + 12y^2 + 36y$ 95) _____
    A) $(y^2 + 36)(y + 1)$ B) $y(y + 6)(y - 6)$ C) $y(y + 36)(y + 1)$ D) $y(y + 6)^2$

Factor the polynomial completely using the general factoring strategy. If the polynomial is not factorable, write "prime."

96) $3(x - 2) - a(x - 2)$ 96) _____
    A) $(3x + 2)(x - a)$ B) $(3 - a)(x - 2)$ C) $3a(x - 2)$ D) $(3x - 2)(x - a)$

Solve the equation using the Zero Factor Property and state the solution set.

97) $(9y + 20)(2y + 25) = 0$ 97) _____
    A) $\left\{-\dfrac{20}{9}, -\dfrac{25}{2}\right\}$ B) $\left\{-\dfrac{9}{11}, -\dfrac{2}{25}\right\}$ C) $\{11, 23\}$ D) $\left\{\dfrac{20}{9}, \dfrac{25}{2}\right\}$

98) $56n^2 + 16n = 0$ 98) _____

    A) $\left\{-\dfrac{2}{7}, 0\right\}$ B) $\left\{-\dfrac{2}{7}, 16\right\}$ C) $\left\{-\dfrac{2}{7}\right\}$ D) $\{0\}$

99) $x^2 - x = 20$ 99) _____

    A) $\{-4, -5\}$ B) $\{4, 5\}$ C) $\{1, 20\}$ D) $\{-4, 5\}$

100) $x(x - 3) = 54$ 100) _____

    A) $\{6, -9\}$ B) $\{-6, -9\}$ C) $\{-6, 9\}$ D) $\{6, 9\}$

Simplify the rational expression.

101) $\dfrac{3x - 15}{x^2 - 25}$ 101) _____

    A) $-\dfrac{3}{x + 5}$ B) $\dfrac{3}{x - 5}$ C) $-\dfrac{12}{x - 25}$ D) $\dfrac{3}{x + 5}$

102) $\dfrac{y^2 - 2y - 8}{y^2 + 8y + 12}$ 102) _____

    A) $\dfrac{y - 4}{y + 6}$ B) $-\dfrac{y^2 - 2y - 8}{y^2 + 8y + 12}$ C) $\dfrac{-2y + 8}{8y - 8}$ D) $\dfrac{-2y - 8}{8y + 12}$

Multiply the rational expressions and write the answer in lowest terms.

103) $\dfrac{8y^4x}{30} \cdot \dfrac{10}{32x^3y^2}$ 103) _____

    A) $\dfrac{y^2}{12x^2}$ B) $\dfrac{x^2y^2}{12}$ C) $\dfrac{1}{12x^2y^2}$ D) $\dfrac{12y^2}{x^2}$

104) $\dfrac{6y^4x}{27} \cdot \dfrac{9}{24x^3y^2}$ 104) _____

    A) $\dfrac{1}{12x^2y^2}$ B) $\dfrac{12y^2}{x^2}$ C) $\dfrac{x^2y^2}{12}$ D) $\dfrac{y^2}{12x^2}$

105) $\dfrac{a^2 - 9b^2}{25ab^2} \cdot \dfrac{5a^2b}{a - 3b}$ 105) _____

    A) $\dfrac{a^2 + 3ab}{5}$ B) $\dfrac{a^2 + 3ab}{5b}$ C) $\dfrac{a + 3b}{5ab}$ D) $\dfrac{a^2 - 3ab}{5b}$

Divide the rational expressions and write the answer in lowest terms.

106) $\dfrac{m^2 - 4}{m^2 + 4m - 12} \div \dfrac{m^2 - 4m - 12}{m - 2}$

    106) _____

    A) $\dfrac{m + 2}{(m + 6)(m - 6)}$
    B) $\dfrac{m - 2}{(m + 6)(m - 6)}$
    C) $\dfrac{m - 2}{m - 6}$
    D) $\dfrac{m - 2}{m^2}$

    Objective: (7.2) Divide Rational Expressions

Add or subtract the rational expressions with common denominators. Write the answer in lowest terms.

107) $\dfrac{7x + 10}{2} - \dfrac{5x}{2}$

    107) _____

    A) $x + 10$
    B) $2x + 5$
    C) $x + 5$
    D) $5x$

    Objective: (7.3) Add or Subtract with Common Denominator

Perform the indicated operations and write the answer in lowest terms.

108) $\dfrac{4}{x} + \dfrac{7}{x - 3}$

    108) _____

    A) $\dfrac{11x - 12}{x(x - 3)}$
    B) $\dfrac{11x - 12}{x(3 - x)}$
    C) $\dfrac{12x - 11}{x(3 - x)}$
    D) $\dfrac{12x - 11}{x(x - 3)}$

    Objective: (7.3) Add or Subtract with Unlike Denominators I

109) $\dfrac{4}{x + 5} - \dfrac{6}{x - 5}$

    109) _____

    A) $\dfrac{-2x + 50}{(x + 5)(x - 5)}$
    B) $\dfrac{-2}{(x + 5)(x - 5)}$
    C) $\dfrac{-2x + 10}{(x + 5)(x - 5)}$
    D) $\dfrac{-2x - 50}{(x + 5)(x - 5)}$

    Objective: (7.3) Add or Subtract with Unlike Denominators I

110) $\dfrac{5w}{w + 9} + \dfrac{5}{w}$

    110) _____

    A) $\dfrac{5w^2 + 5w + 5}{w(w + 9)}$
    B) $\dfrac{5w^2 + 5}{w(w + 9)}$

    C) $\dfrac{5w^2 + 5w + 45}{w(w + 9)}$
    D) $\dfrac{5w + 5}{w(w + 9)}$

    Objective: (7.3) Add or Subtract with Unlike Denominators I

111) $\dfrac{16}{x^2 - 64} + \dfrac{1}{x + 8}$

    111) _____

    A) $\dfrac{1}{x + 8}$
    B) $\dfrac{17}{x^2 - 64}$
    C) $\dfrac{1}{8 - x}$
    D) $\dfrac{1}{x - 8}$

    Objective: (7.3) Add or Subtract with Unlike Denominators I

Simplify the complex fraction.

112) $\dfrac{\dfrac{14}{y^2 - 49}}{\dfrac{35}{y - 7}}$

112) _____

    A) $\dfrac{5}{2(y + 7)}$ B) $\dfrac{2}{5(y + 7)}$ C) $\dfrac{2}{5(y - 7)}$ D) $\dfrac{2(y + 7)}{5}$

Objective: (7.4) Simplify Complex Fractions by Multiplying by Reciprocal

113) $\dfrac{64 - \dfrac{8}{z}}{8 - \dfrac{1}{z}}$

113) _____

    A) 8   B) 8z   C) $\dfrac{1}{8}$ D) $\dfrac{8}{z}$

Objective: (7.4) Simplify Complex Fractions by Multiplying by Reciprocal

114) $\dfrac{\dfrac{3}{x} + \dfrac{2}{x^2}}{\dfrac{9}{x^2} - \dfrac{4}{x}}$

114) _____

    A) $\dfrac{1}{3 - 2x}$ B) $\dfrac{1}{3x - 2}$ C) $\dfrac{3x^2 + 2}{9 - 4x}$ D) $\dfrac{3x + 2}{9 - 4x}$

Objective: (7.4) Simplify Complex Fractions by Multiplying by LCD/LCD

115) $\dfrac{\dfrac{5}{x} - \dfrac{4}{y}}{\dfrac{2}{x} + \dfrac{3}{y}}$

115) _____

    A) $\dfrac{5x - 4y}{2x + 3y}$ B) $\dfrac{5y + 4x}{2y - 3x}$ C) $\dfrac{5y - 4x}{2y + 3x}$ D) $\dfrac{x + y}{5(x - y)}$

Objective: (7.4) Simplify Complex Fractions by Multiplying by LCD/LCD

116) $\dfrac{\dfrac{x}{36} - \dfrac{1}{x}}{1 + \dfrac{6}{x}}$

116) _____

    A) $\dfrac{36}{x - 6}$ B) $\dfrac{x + 6}{36}$ C) $\dfrac{x - 6}{36}$ D) $\dfrac{36}{x + 6}$

Objective: (7.4) Simplify Complex Fractions by Multiplying by LCD/LCD

117) $\dfrac{9 + \dfrac{3}{x}}{\dfrac{x}{4} + \dfrac{1}{12}}$

117) _____

    A) 1   B) $\dfrac{x}{36}$ C) $\dfrac{36}{x}$ D) 36

118) $\dfrac{\dfrac{36t^2 - 16u^2}{t\,u}}{\dfrac{6}{u} - \dfrac{4}{t}}$

118) _____

    A) $6t + 4u$ B) $4t + 6u$ C) $\dfrac{tu}{6t + 4u}$ D) $\dfrac{4t + 6u}{tu}$

Find any excluded values and state the domain of the rational function using interval notation or set –builder notation as appropriate.

119) $f(x) = 8 + \dfrac{6}{x + 4}$

119) _____

    A) $D = (-\infty, \infty)$ B) $D = \{x \mid x \ne -4 \text{ and } x \ne 4\}$
    C) $D = \{x \mid x \ne -4\}$ D) $D = \{x \mid x \ne -6\}$

120) $f(y) = \dfrac{y^2 - 24y}{6y}$

120) _____

    A) $D = \{y \mid y \ne 6\}$ B) $D = \left\{y \mid y \ne \dfrac{1}{6}\right\}$

    C) $D = \{y \mid y \ne 0\}$ D) $D = \{y \mid y \ne 0 \text{ and } y \ne 24\}$

121) $f(x) = \dfrac{x^2 - 36}{x^2 - 11x + 30}$

121) _____

    A) $D = \{x \mid x \ne -5 \text{ and } x \ne -6\}$ B) $D = \{x \mid x \ne 6 \text{ and } x \ne -6\}$
    C) $D = \{x \mid x \ne 0\}$ D) $D = \{x \mid x \ne 5 \text{ and } x \ne 6\}$

Solve the equation.

122) $\dfrac{6}{x} - \dfrac{1}{4} = \dfrac{4}{x}$

122) _____

    A) $\{-8\}$ B) $\{-2\}$ C) $\{8\}$ D) $\left\{\dfrac{2}{3}\right\}$

123) $\dfrac{2}{y+2} - \dfrac{5}{y-2} = \dfrac{10}{y^2-4}$

123) _____

    A) $\{8\}$ B) $\{\sqrt{4}\}$ C) $\{-8\}$ D) $\{24\}$

Solve the formula for the indicated variable.

124) $L = \dfrac{P}{2} - W$ for P

124) _____

    A) $P = 2L + 2W$ B) $P = 2LW$ C) $P = 2L + W$ D) $P = 2L - 2W$

125) $\dfrac{1}{a} + \dfrac{1}{b} = c$ for a

125) _____

    A) $a = \dfrac{1}{c} - b$ B) $a = \dfrac{b}{bc-1}$ C) $a = \dfrac{1}{bc}$ D) $a = bc - \dfrac{1}{b}$

Translate the statement and find the variation constant, k.

126) y varies directly with x and y = 15 when x = 12.

126) _____

    A) $\dfrac{4}{5}$ B) 3   C) $\dfrac{1}{3}$ D) $\dfrac{5}{4}$

Solve the variation problem.

127) C varies directly with v. If C = 225 when v = 9, find C if v = 14.

127) _____

    A) 126   B) 336   C) 350   D) 375

Simplify using the product rule for radicals.

128) $\sqrt{180}$

128) _____

    A) $5\sqrt{6}$ B) 30   C) $6\sqrt{5}$ D) 13

Write in simplified radical form. Assume that all variables represent positive real numbers.

129) $\sqrt{169x^6yz^9}$

129) _____

    A) $13x^4z^7\sqrt{y}$ B) $6.5x^3z^4\sqrt{xyz}$ C) $6.5x^3yz^4$ D) $13x^3z^4\sqrt{yz}$

Perform the indicated operations. Write the answer in simplified radical form. Assume that all variables represent positive real numbers.

130) $12\sqrt{2} - 8\sqrt{2} - \sqrt{2}$

130) _____

    A) $-5\sqrt{2}$ B) $3\sqrt{2}$ C) $4\sqrt{2}$ D) $5\sqrt{2}$

Using the Pythagorean Theorem, $a^2 + b^2 = c^2$, find the missing length of the side of the triangle. Write your answer in simplified radical form.

131)

    131) _____
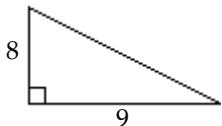
    A) 145   B) $\sqrt{145}$ C) 17   D) $\sqrt{17}$

Objective: (8.1) Solve Application

Multiply. Write the answer in simplified radical form. Assume that all variables represent positive real numbers.

132) $(1 + 3\sqrt{7})(1 - 3\sqrt{7})$ 132) _____

    A) –62   B) $1 + 6\sqrt{7}$ C) $1 - 6\sqrt{7}$ D) 64

Objective: (8.2) Multiply Square Roots (Distribute/FOIL/Special Product)

Solve the problem by utilizing the 4P's: Prepare, Plan, Process, and Ponder. Find the speed, S, of the accident vehicle using the formula $S = s\sqrt{\dfrac{D}{d}}$, where s is the speed of the test vehicle, D is the length of the skid marks at the accident scene, and d is the length of the skid marks left by the test vehicle.

133) Skid marks at an accident scene are 125 feet in length. If the speed of the test vehicle was 36 mph   133) _____
and it left 48 feet of skid marks, how fast was the other car traveling before the accident?

    A) $5\sqrt{10}$ mph   B) $5\sqrt{15}$ mph   C) $15\sqrt{10}$ mph   D) $15\sqrt{15}$ mph

Objective: (8.2) Solve 4Ps Application

Solve and write the solution using set notation.

134) $\sqrt{7 - x} = x - 1$ 134) _____

    A) { }   B) {–2, 3}   C) {–2}   D) {3}

Objective: (8.3) Solve Equation Containing Square Root (Square Binomial)

Solve the problem by utilizing the 4P's: Prepare, Plan, Process, and Ponder. The formula $t = 2\pi\sqrt{\dfrac{L}{g}}$ represents the time (in seconds) for a pendulum of length L (in feet) to complete one cycle, where g is the gravitational constant of approximately 32 feet per second squared. Use the formula to find the exact and approximate lengths in the following application.

135) Find the length of the pendulum in a clock tower if it takes 5 seconds for the pendulum to   135) _____
complete one cycle.

    A) $L = \dfrac{200}{\pi}$ ft., or approximately 63.65 ft.   B) $L = \dfrac{100}{\pi^2}$ ft., or approximately 10.13 ft.

    C) $L = \dfrac{200}{\pi^2}$ ft., or approximately 20.26 ft.   D) $L = \dfrac{40}{\pi^2}$ ft., or approximately 4.05 ft.

Objective: (8.3) Solve 4Ps Application

Solve the problem by utilizing the 4P's: Prepare, Plan, Process, and Ponder.

136) The radius of a sphere is given by the formula $r = \sqrt{\dfrac{S}{4\pi}}$, where S is the surface area of the sphere.　　136) _____

Use the formula to solve the application. Joan Lone is an astronomy student at a local community college. As part of her final project she has designed a model of the solar system. In this model, the sphere representing the planet Jupiter has a surface area of approximately 180 square centimeters. Find the radius of this sphere. Give your answer in exact form and as a decimal rounded to the nearest tenth of a centimeter.

A) $\dfrac{6\sqrt{5\pi}}{\pi}$ cm or 7.6 cm

B) $\dfrac{3\sqrt{5\pi}}{\pi}$ cm or 3.8 cm

C) $\dfrac{3\sqrt{5}}{\pi}$ cm or 2.1 cm

D) $\dfrac{18\sqrt{5\pi}}{\pi}$ cm or 22.7 cm

Objective: (8.4) Solve 4Ps Application

Simplify using the product rule or quotient rule for radicals. Write the answer in simplified radical form. Assume that all variables represent positive real numbers.

137) $\sqrt[3]{-27a^{11}b^{13}}$　　137) _____

A) $-3ab\sqrt[3]{a^5b^4}$ 　　 B) $3\sqrt{a^{13}b^{11}}$ 　　 C) $-3a^3b^4\sqrt[3]{a^2b}$ 　　 D) $-3a^2b\sqrt[3]{a^3b^4}$

Objective: (8.5) Simplify Radical Using Product Rule or Quotient Rule

Solve and write the solution using set notation.

138) $\sqrt[4]{2x-4} + 3 = 7$　　138) _____

A) {260} 　　 B) {10} 　　 C) {130} 　　 D) {−38}

Objective: (8.6) Solve Equation Containing Higher Root

Find the functional value and write the answer as an ordered pair.

139) $h(x) = 3x^2 - 7x - 4$, $h(-5)$　　139) _____

A) (−5, −114) 　　 B) (−5, −44) 　　 C) (−5, 36) 　　 D) (−5, 106)

Objective: (9.1) Find Functional Value (Number)

140) $g(t) = 8t^2 - 5t$, $g\left(\dfrac{1}{2}\right)$　　140) _____

A) $\left(\dfrac{1}{2}, \dfrac{1}{2}\right)$ 　　 B) $\left(\dfrac{1}{2}, -\dfrac{1}{2}\right)$ 　　 C) $\left(\dfrac{1}{2}, \dfrac{3}{2}\right)$ 　　 D) $\left(\dfrac{1}{2}, -\dfrac{3}{2}\right)$

Objective: (9.1) Find Functional Value (Number)

141) $f(x) = |5x - 4|$, $f(-3)$　　141) _____

A) (−3, 11) 　　 B) (−3, −19) 　　 C) (−3, −11) 　　 D) (−3, 19)

Objective: (9.1) Find Functional Value (Number)

Find the following function and its domain.

142) Let $f(x) = 4 - 9x$ and $g(x) = -2x + 9$. Find $(f + g)(x)$. 142) _____

A) $-7x + 13$, $D = \left\{x \mid x \neq -\dfrac{13}{7}\right\}$

B) $-2x + 4$, $D = \left\{x \mid x \neq 2\right\}$

C) $2x$, $D = (-\infty, \infty)$

D) $-11x + 13$, $D = (-\infty, \infty)$

143) Let $f(x) = 2x^2 - 3$ and $g(x) = 7x - 4$. Find $(f - g)(x)$. 143) _____

A) $2x^2 - 7x + 1$, $D = (-\infty, \infty)$

B) $-5x - 7$, $D = \left\{x \mid x \neq -\dfrac{7}{5}\right\}$

C) $2x^2 - 7x - 7$, $D = (-\infty, \infty)$

D) $9x + 1$, $D = \{x \mid x \neq 1\}$

144) Let $f(x) = 5x + 1$ and $g(x) = 2x - 5$. Find $\left(\dfrac{f}{g}\right)(x)$. 144) _____

A) $\dfrac{2x - 5}{5x + 1}$, $D = \left\{x \mid x \neq -\dfrac{1}{5}\right\}$

B) $\dfrac{5x + 1}{2x - 5}$, $D = \left\{x \mid x \neq \dfrac{5}{2}\right\}$

C) $\dfrac{2x - 5}{5x + 1}$, $D = \left\{x \mid x \neq \dfrac{5}{2}\right\}$

D) $\dfrac{5x + 1}{2x - 5}$, $D = \left\{x \mid x \neq -\dfrac{1}{5}\right\}$

145) Let $f(x) = 5x^2 - 2$ and $g(x) = 4x + 1$. Find $(f \cdot g)(x)$. 145) _____

A) $20x^3 + 5x^2 - 8x - 2$, $D = (-\infty, \infty)$

B) $5x^2 + 4x - 2$, $D = (-\infty, \infty)$

C) $20x^3 - 8x - 2$, $D = \{x \mid x \neq 0\}$

D) $20x^3 + 5x^2 - 2$, $D = (-\infty, \infty)$

Graph the function by plotting points. State the domain and range.

146) $f(x) = 5$ 146) _____
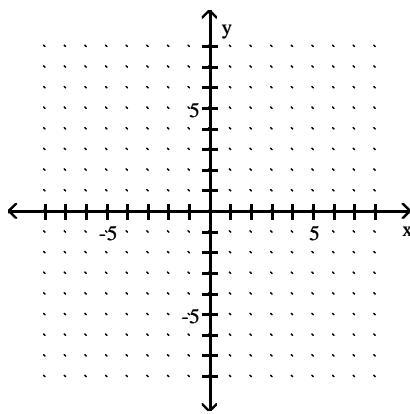
A) D = {5}
   R = (-∞, ∞)
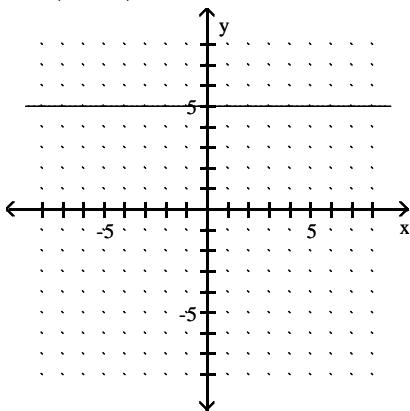
B) D = (-∞, ∞)
   R = {5}
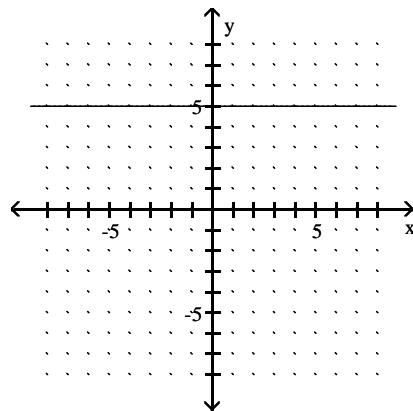
C) D = {5}
   R = (-∞, ∞)
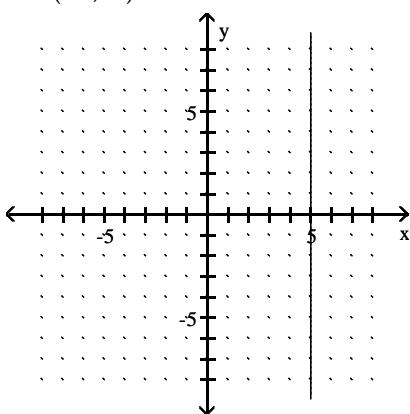
D) D = (-∞, ∞)
   R = (-∞, ∞)
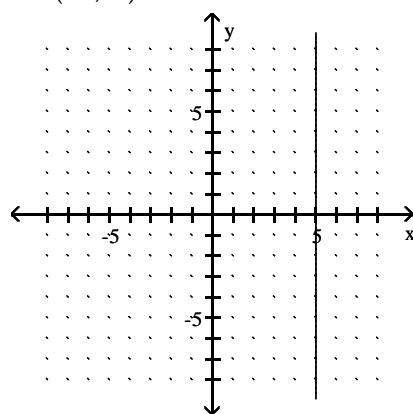
Objective: (9.3) Graph Function
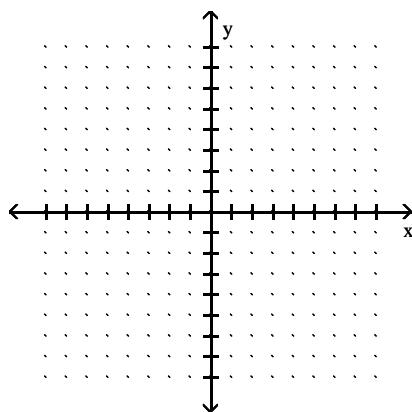
147) $g(x) = \sqrt{x - 1}$ 147) _____

A) D = [0, ∞)
   R = [1, ∞)
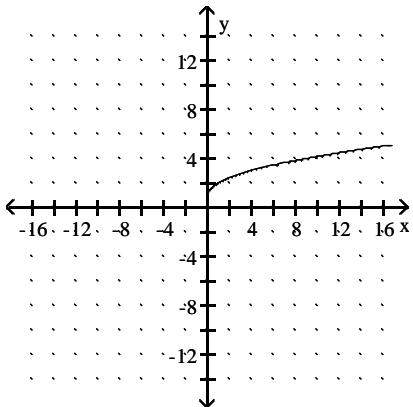
B) D = [−1, ∞)
   R = [0, ∞)
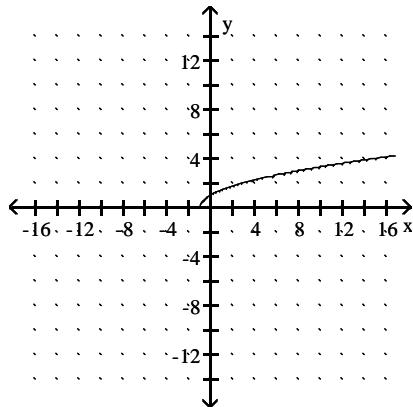
C) D = [0, ∞)
   R = [−1, ∞)
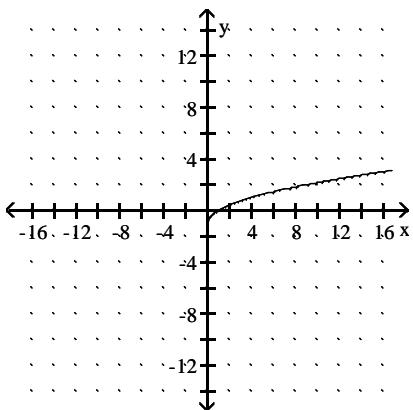
D) D = [1, ∞)
   R = [0, ∞)
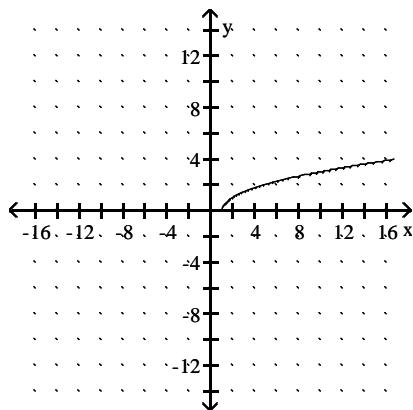
Objective: (9.3) Graph Function

148) $f(x) = \sqrt{5 - x}$
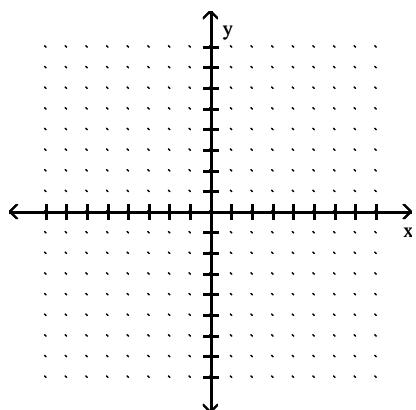
148) _____

A) D = (−∞, 5]
   R = (−∞, 0]
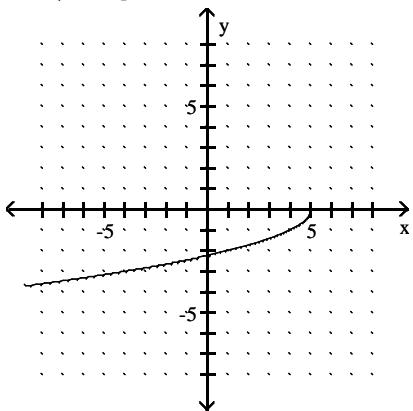
B) D = [5, ∞)
   R = [0, ∞)
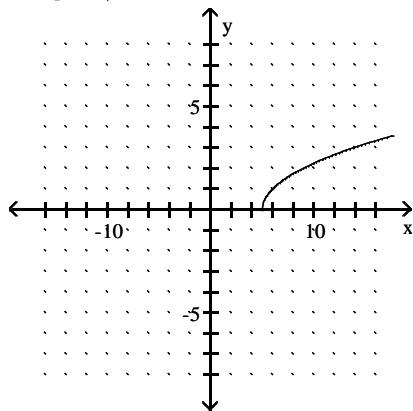
C) D = [0, ∞)
   R = [−5, ∞)
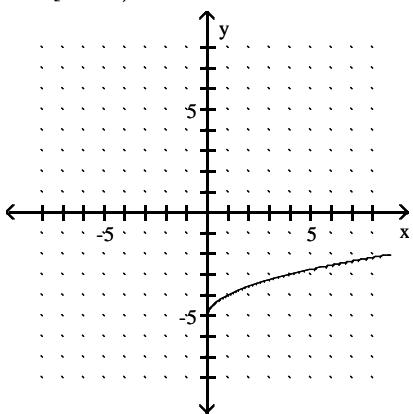
D) D = (−∞, 5]
   R = [0, ∞)
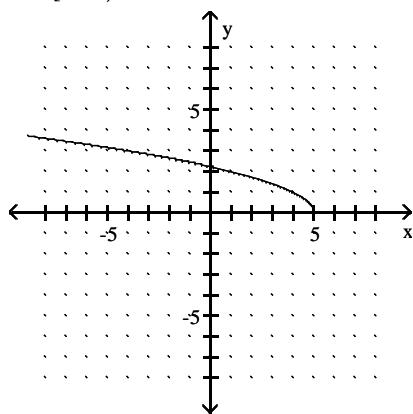
Objective: (9.3) Graph Function

Match the function with the appropriate graph of the transformation of the function $g(x) = x^2$.

149) $f(x) = (x - 3)^2$

A)

B)

C)

D)
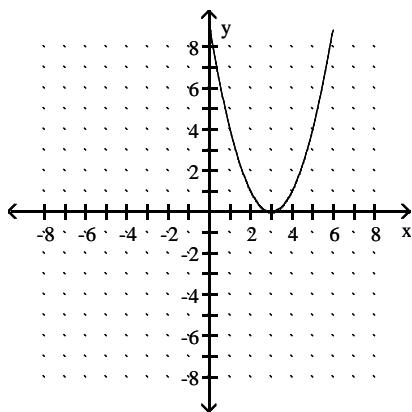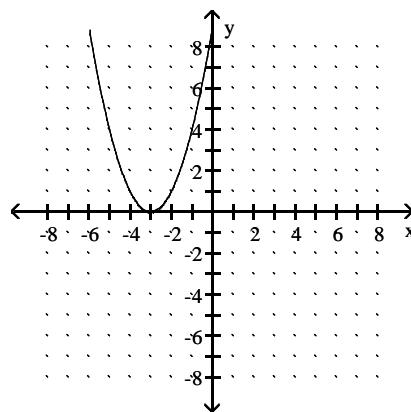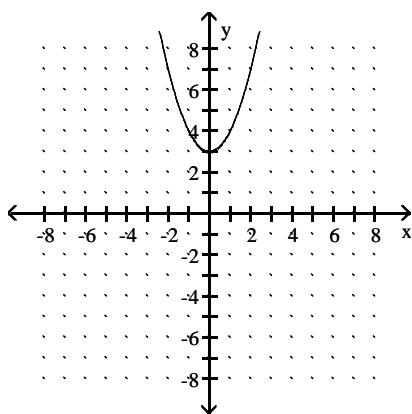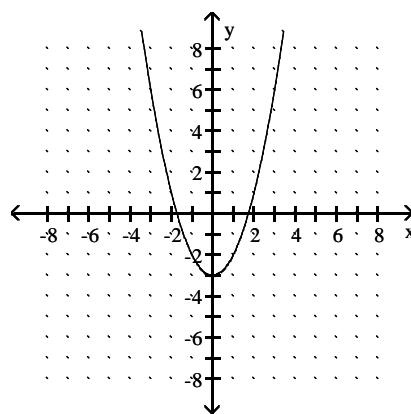
Objective: (9.4) Match Function to Its Graph

150) $f(x) = -x^2 + 2$ 150) _____

A)

B)

C)

D)
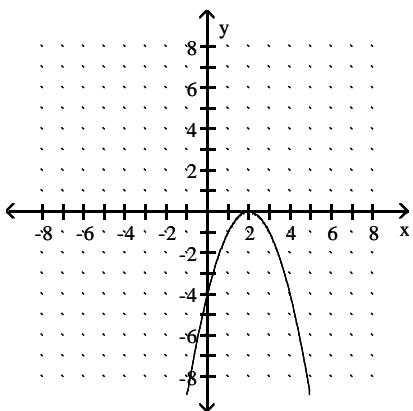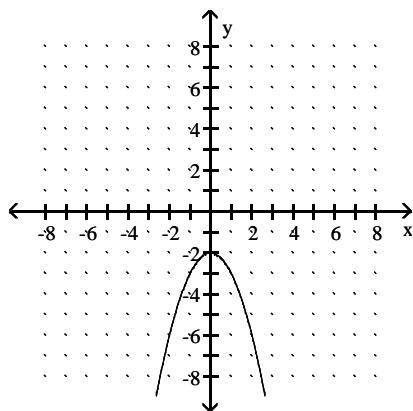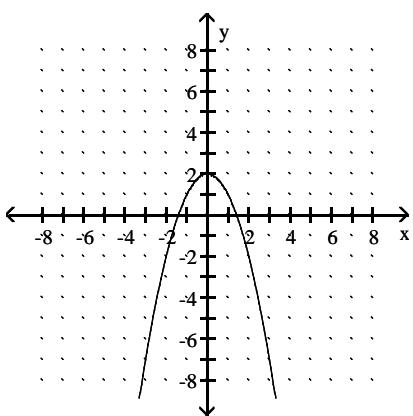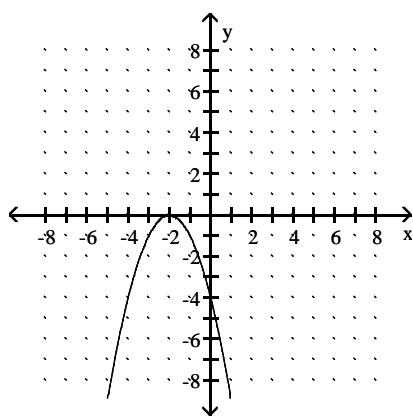
Objective: (9.4) Match Function to Its Graph

151) $f(x) = (x + 4)^2 - 5$ 151) _____

A)

B)

C)

D)
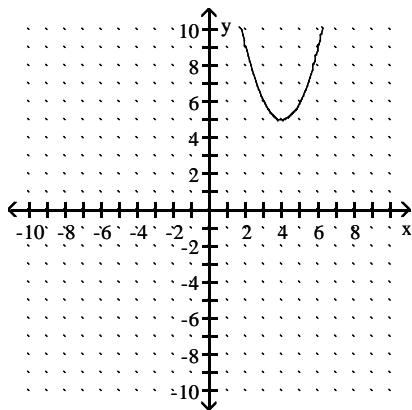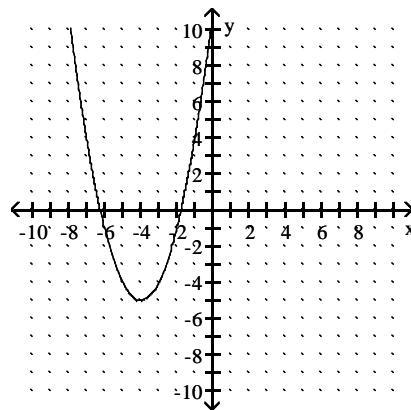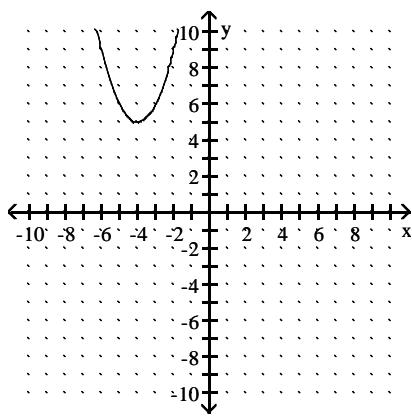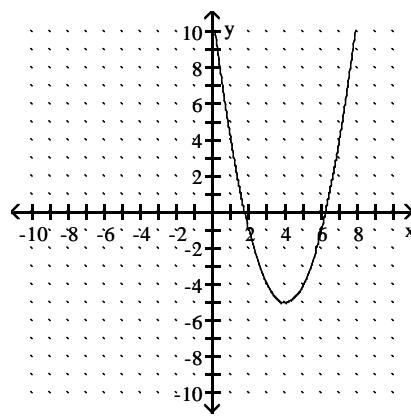
Objective: (9.4) Match Function to Its Graph

Using transformations and/or reflections and one of the basic graphs, state the transformation and/or reflection and sketch the function.

152) $g(x) = (x - 3)^2$ 152) _____
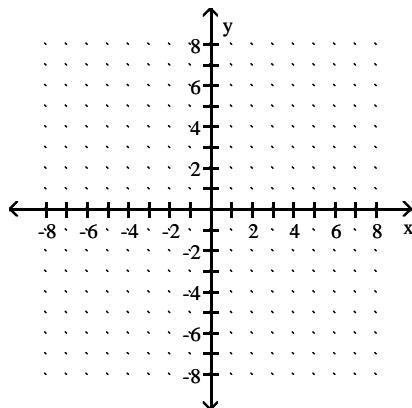
A) This is the graph of $f(x) = x^2$ shifted to the left 3 units.
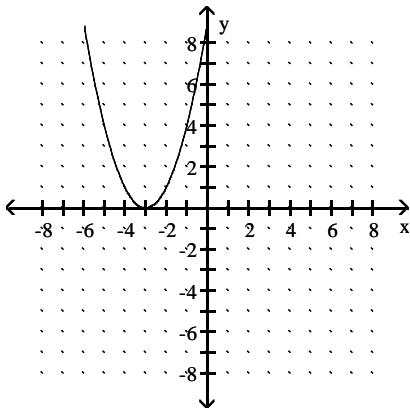
B) This is the graph of $f(x) = x^2$ shifted to the right 3 units.
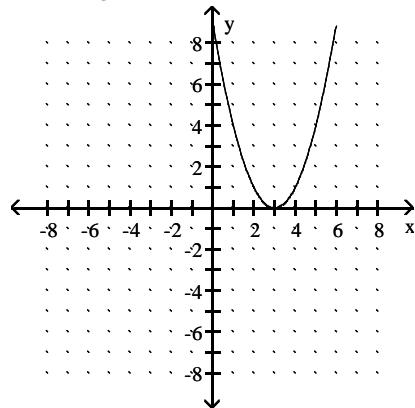
C) This is the graph of $f(x) = x^2$ shifted up 3 units.
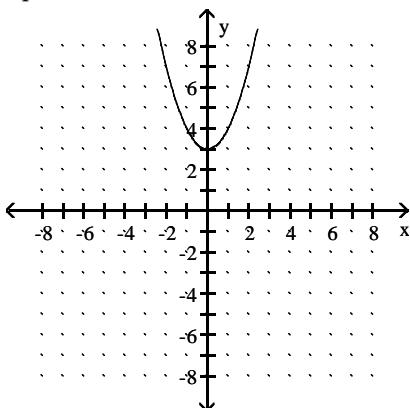
D) This is the graph of $f(x) = x^2$ shifted down 3 units.
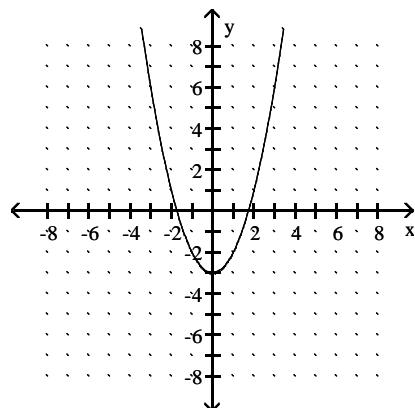
Objective: (9.4) Use Transformations to Graph Function

153) $f(x) = |x + 3|$
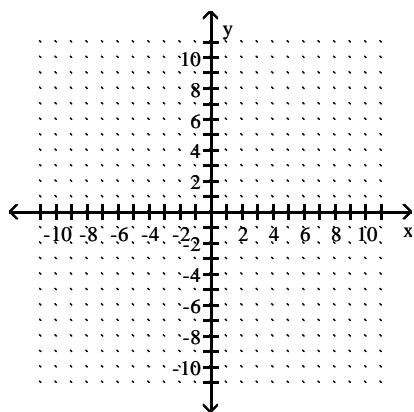
153) _____

A) This is the graph of $f(x) = |x|$ shifted to the left 3 units.
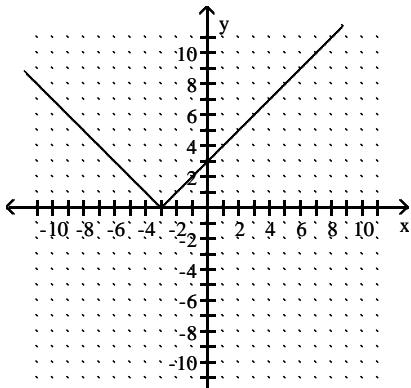
B) This is the graph of $f(x) = |x|$ shifted up 3 units.
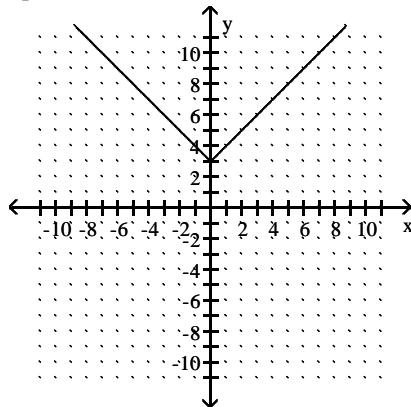
C) This is the graph of $f(x) = |x|$ shifted down 3 units.
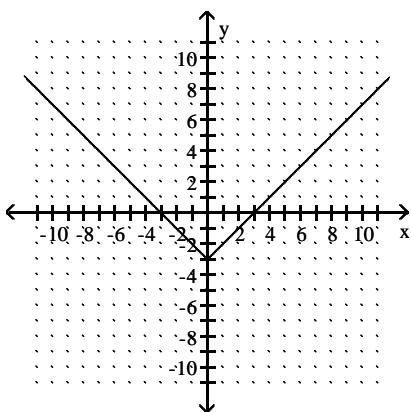
D) This is the graph of $f(x) = |x|$ shifted to the right 3 units.
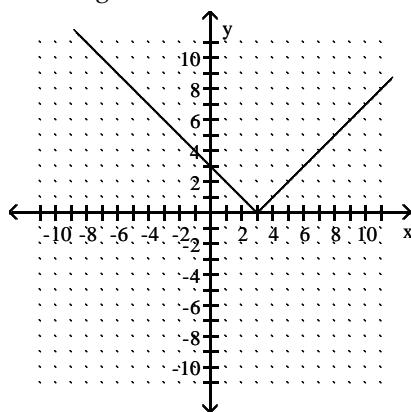
Objective: (9.4) Use Transformations to Graph Function

154) $g(x) = (x + 3)^2 - 1$

154) _____

33
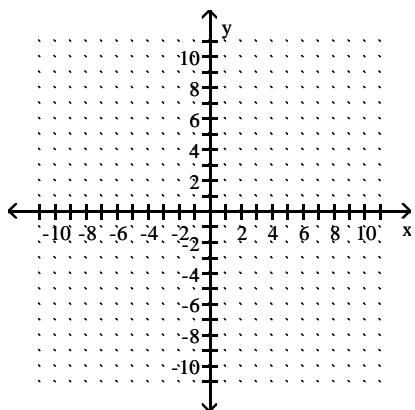
A) This is the graph of $f(x) = x^2$ shifted to the right 3 units and then shifted down 1 unit.

B) This is the graph of $f(x) = x^2$ shifted to the left 1 unit and then shifted up 3 units.
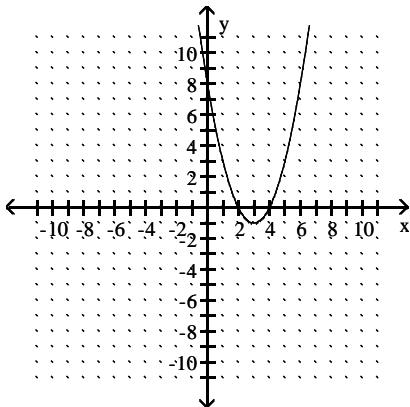
C) This is the graph of $f(x) = x^2$ shifted to the right 1 unit and then shifted up 3 units.
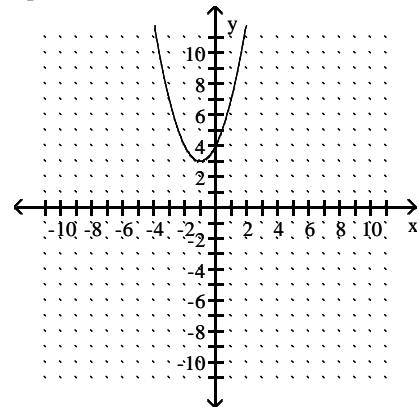
D) This is the graph of $f(x) = x^2$ shifted to the left 3 units and then shifted down 1 unit.
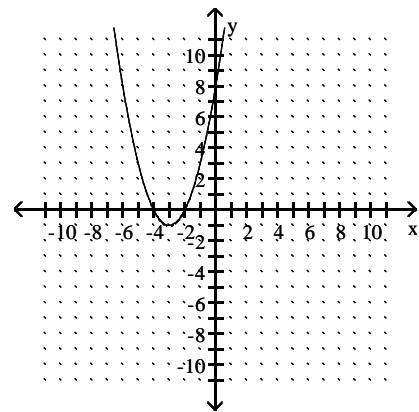
Objective: (9.4) Use Transformations to Graph Function

155) $f(x) = \sqrt{x + 2} - 7$

155) _____

34
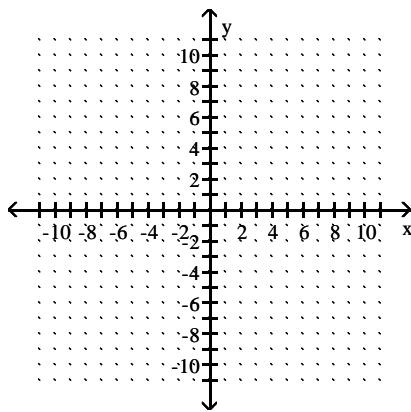
A) This is the graph of $f(x) = \sqrt{x}$ shifted 7 units to the left and then shifted up 2 units.

B) This is the graph of $f(x) = \sqrt{x}$ shifted 7 units to the right and then shifted up 2 units.
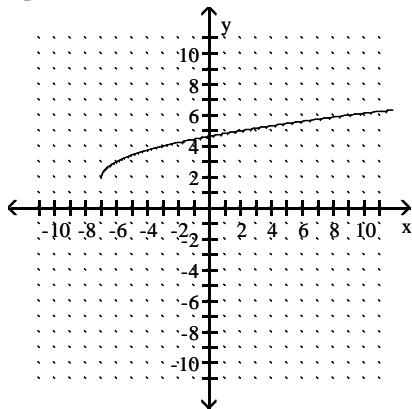
C) This is the graph of $f(x) = \sqrt{x}$ shifted to the right 2 units and then shifted down 7 units.
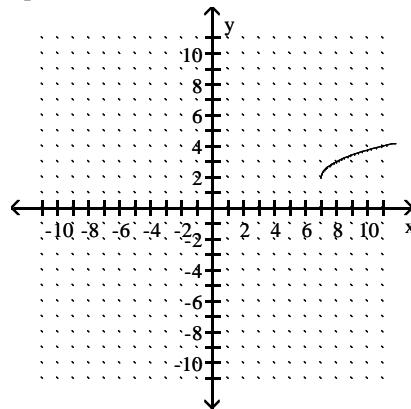
D) This is the graph of $f(x) = \sqrt{x}$ shifted to the left 2 units and then shifted down 7 units.
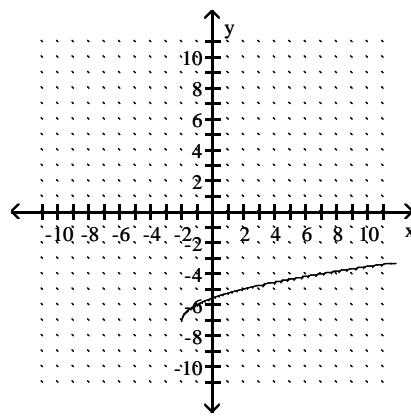
Objective: (9.4) Use Transformations to Graph Function

156) $f(x) = -\sqrt{x-6}$
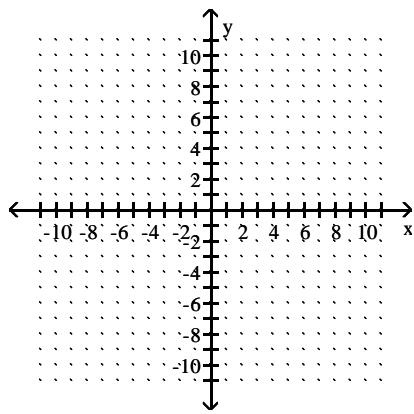
156) _____
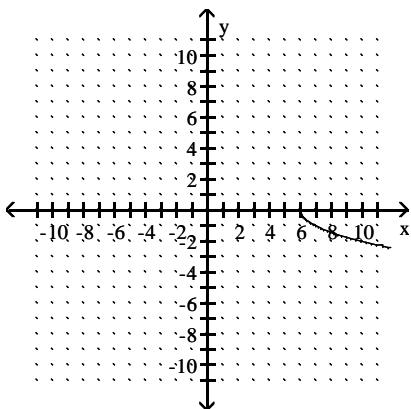
A) This is the graph of $f(x) = \sqrt{x}$ shifted right 6 units and then reflected about the x–axis.

B) This is the graph of $f(x) = \sqrt{x}$ shifted left 6 units and then reflected about the y–axis.
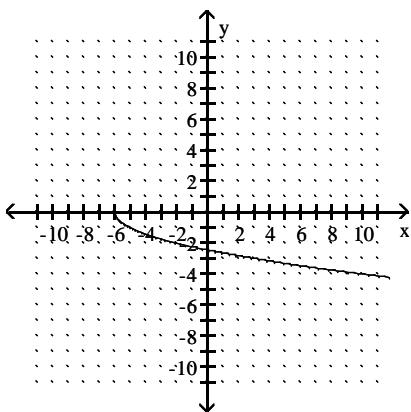
C) This is the graph of $f(x) = \sqrt{x}$ shifted left 6 units and then reflected about the x–axis.
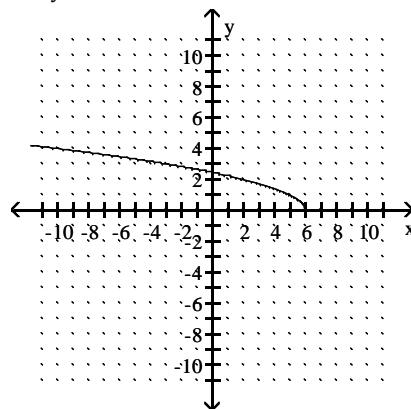
D) This is the graph of $f(x) = \sqrt{x}$ shifted right 6 units and then reflected about the y–axis.
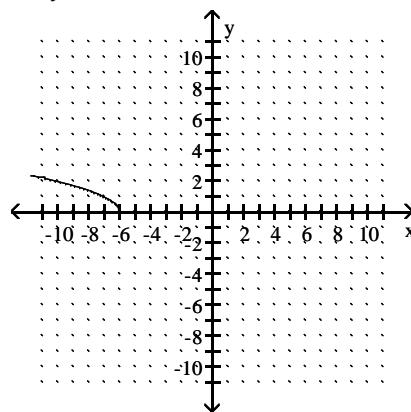
Objective: (9.4) Use Transformations and Reflections to Graph Function

157) $h(x) = -\sqrt{x + 3} - 5$
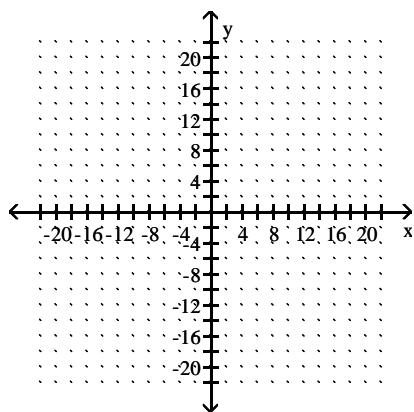
157) _____

36
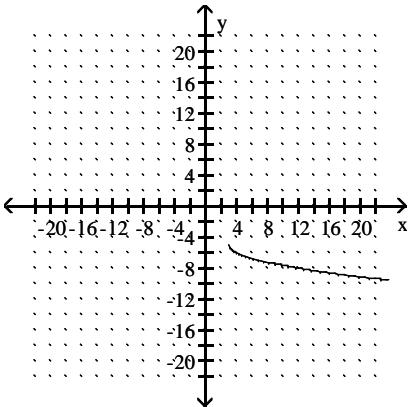
A) This is the graph of $f(x) = \sqrt{x}$ shifted to the right 3 units, reflected about the x-axis and then shifted down 5 units.

B) This is the graph of $f(x) = \sqrt{x}$ shifted to the left 3 units, reflected about the x-axis and then shifted down 5 units.
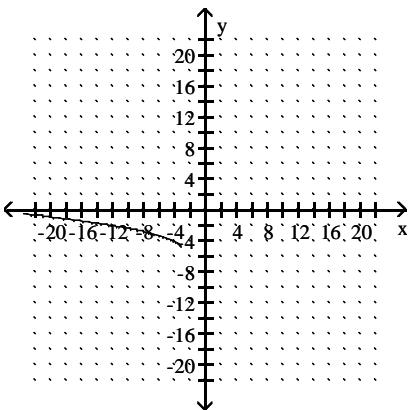
C) This is the graph of $f(x) = \sqrt{x}$ shifted to the right 3 units, reflected about the y-axis and then shifted down 5 units.
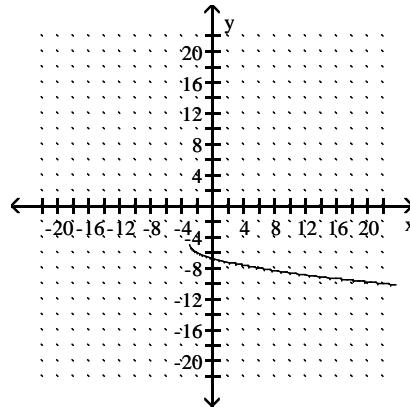
D) This is the graph of $f(x) = \sqrt{x}$ shifted to the left 3 units, reflected about the y-axis and then shifted down 5 units.
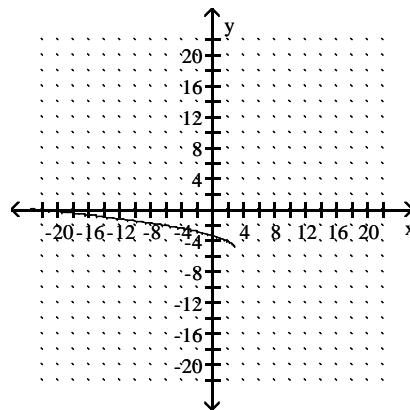
Objective: (9.4) Use Transformations and Reflections to Graph Function

Perform the indicated operations and write the answer in the standard form a + bi.

158) $\dfrac{7i}{2 - 14i}$

158) _____

A) $-\dfrac{49}{100} + \dfrac{7}{100}i$ 　　　 B) $\dfrac{7}{100} + \dfrac{49}{100}i$ 　　　 C) $\dfrac{49}{100} + \dfrac{7}{100}i$ 　　　 D) $\dfrac{7}{100} - \dfrac{49}{100}i$

Objective: (10.1) Multiply or Divide Complex Numbers

159) $\dfrac{5 - i}{-9 + 4i}$

159) _____

A) $\dfrac{49}{97} - \dfrac{11}{97}i$ 　　　 B) $\dfrac{1}{97} - \dfrac{11}{97}i$ 　　　 C) $-\dfrac{11}{97}i$ 　　　 D) $-\dfrac{49}{97} - \dfrac{11}{97}i$

Objective: (10.1) Multiply or Divide Complex Numbers

37

Solve using the Zero Factor Property.

160) $7x^2 + 19x - 6 = 0$

    A) $\left\{-\dfrac{1}{3}, \dfrac{7}{2}\right\}$ B) $\left\{-\dfrac{7}{2}, \dfrac{1}{3}\right\}$ C) $\left\{-\dfrac{2}{7}, 3\right\}$ D) $\left\{-3, \dfrac{2}{7}\right\}$

    Objective: (10.2) Solve Using Zero Factor Property

160) _____

161) $4x^2 + 7x - 15 = 0$

    A) $\left\{-\dfrac{5}{4}, 3\right\}$ B) $\left\{-\dfrac{4}{5}, \dfrac{1}{3}\right\}$ C) $\left\{-3, \dfrac{5}{4}\right\}$ D) $\left\{-\dfrac{1}{3}, \dfrac{4}{5}\right\}$

    Objective: (10.2) Solve Using Zero Factor Property

161) _____

162) $8x^2 + 17x - 21 = 0$

    A) $\left\{-3, \dfrac{7}{8}\right\}$ B) $\left\{-\dfrac{1}{3}, \dfrac{8}{7}\right\}$ C) $\left\{-\dfrac{7}{8}, 3\right\}$ D) $\left\{-\dfrac{8}{7}, \dfrac{1}{3}\right\}$

    Objective: (10.2) Solve Using Zero Factor Property

162) _____

Solve using the Square Root Property.

163) $x^2 = 25$

    A) {5}   B) {–5, 5}   C) {625}   D) $\left\{-\dfrac{1}{5}, \dfrac{1}{5}\right\}$

    Objective: (10.2) Solve Using Square Root Property

163) _____

164) $x^2 = 18$

    A) $\{-9\sqrt{2}, 9\sqrt{2}\}$ B) $\{-3\sqrt{2}, 3\sqrt{2}\}$ C) $\{3\sqrt{2}\}$ D) $\{9\sqrt{2}\}$

    Objective: (10.2) Solve Using Square Root Property

164) _____

165) $(x - 7)^2 = 25$

    A) {32}   B) {5, –5}   C) {12, 2}   D) {2, –12}

    Objective: (10.2) Solve Using Square Root Property

165) _____

166) $(4x + 3)^2 - 7 = 0$

    A) $\left\{\dfrac{3 - \sqrt{7}}{4}, \dfrac{3 + \sqrt{7}}{4}\right\}$ B) $\left\{\dfrac{-3 - \sqrt{7}}{4}, \dfrac{-3 + \sqrt{7}}{4}\right\}$

    C) $\left\{-\dfrac{5}{2}, 1\right\}$ D) $\left\{\dfrac{\sqrt{7} - 3}{4}, \dfrac{\sqrt{7} + 3}{4}\right\}$

    Objective: (10.2) Solve Using Square Root Property

166) _____

Solve by completing the square.

167) $x^2 - 6x + 18 = 0$

    A) {0, 6}   B) {3 – 3i, 3 + 3i}   C) {3 – 9i, 3 + 9i}   D) {3 + 3i}

    Objective: (10.2) Solve by Completing the Square

167) _____

168) $3x^2 + 15x = -18$

    A) {–3, 2}   B) {–3, –2}   C) $\left\{-\dfrac{1}{2}, \dfrac{1}{2}\right\}$ D) {2, 3}

    Objective: (10.2) Solve by Completing the Square

168) _____

Solve using the Quadratic Formula.

169) $5x^2 + 8x = 4$

169) _____

A) $\left\{\dfrac{5}{2}, 2\right\}$
B) $\left\{0, \dfrac{8}{5}\right\}$
C) $\left\{-\dfrac{8}{5}, 0\right\}$
D) $\left\{-2, \dfrac{2}{5}\right\}$

Solve by the method of your choice.

170) $x^2 + 2x - 24 = 0$

170) _____

A) {− 6, 4}
B) {6, −4}
C) {−24, 0}
D) {6, 4}

171) $x^2 + 14x + 74 = 0$

171) _____

A) {−7 − 5i, −7 + 5i}
B) {−7 + 5i}
C) {−7 − 25i, −7 + 25i}
D) {−12, −2}

Solve the application using the Pythagorean theorem.

172) A bird flies 36 meters in a straight line from the top of a vertical cliff to a point on the ground 23 meters from the base of the cliff. Find the height of the cliff. Round to the nearest hundredth of a meter.

172) _____

36 m
?
23 m
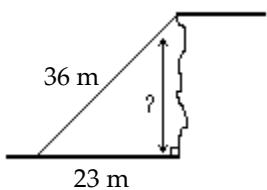
A) Approximately 42.72 meters
B) Approximately 27.15 meters
C) Approximately 13 meters
D) Approximately 27.69 meters

173) One end of a guy wire is attached to the top of a 13−foot pole and the other end is anchored into the ground 9 feet from the base of the pole. Find the length of the guy wire. Round to the nearest tenth of a foot.

173) _____
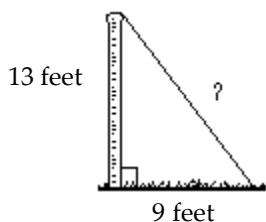
13 feet
?
9 feet

A) Approximately 15.8 feet
B) Approximately 22.5 feet
C) Approximately 22 feet
D) Approximately 15.3 feet

Solve the formula for the indicated variable.

174) $V = \frac{1}{3}s^2h$ for s (volume of a square pyramid)   174) _____

   A) $s = \sqrt{3Vh}$ B) $s = \dfrac{\sqrt{3Vh}}{h}$ C) $s = \dfrac{\sqrt{3Vh}}{3h}$ D) $s = \dfrac{\sqrt{3V}}{h}$

Determine a) if the parabola opens up/down or left/right, b) the axis of symmetry, c) the vertex, and d) the intercepts. Then graph the parabola given by the quadratic equation.

175) $y = x^2 - 9$ 175) _____
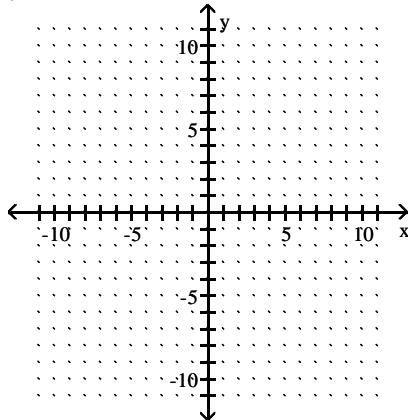
A) a. up, b. $x = 0$, c. $(0, -9)$, d. $(-3, 0)$ and $(3, 0)$
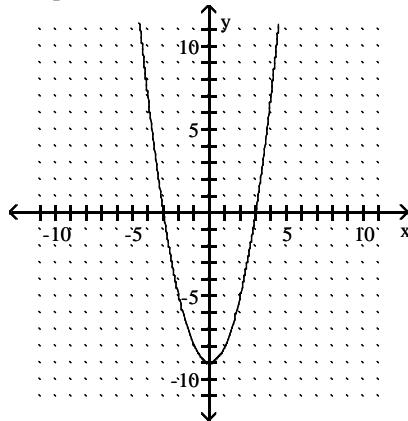
B) a. down, b. $x = 0$, c. $(0, -9)$, d. none

40
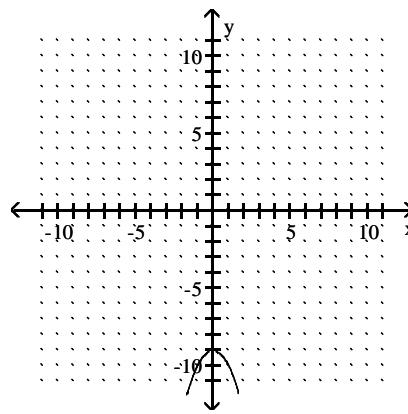
C) a. up, b. x = 0, c. (0, 9), d. none
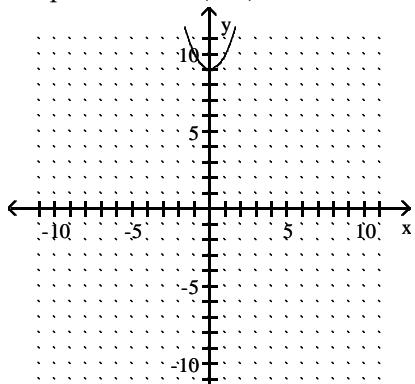
D) a. up, b. x = –9, c. (–9, 0), d. (–9, 0)
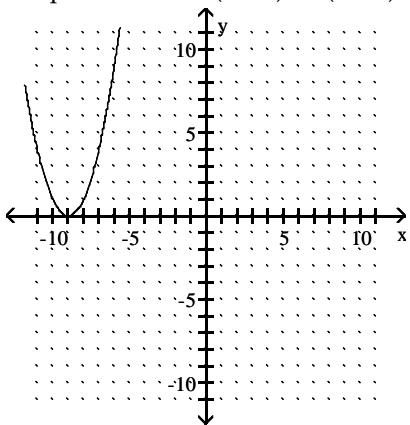
Objective: (11.1) Graph Parabola and State Characteristics

Graph the quadratic equation.

176) $y = (x - 3)^2 + 6$

176) _____

A)

B)

C)

D)
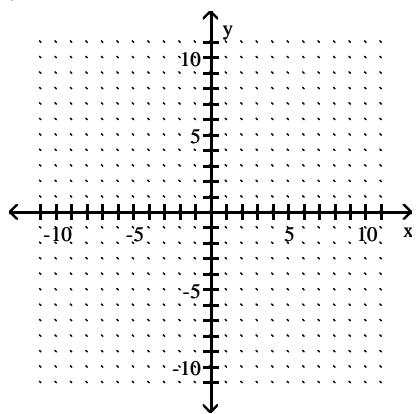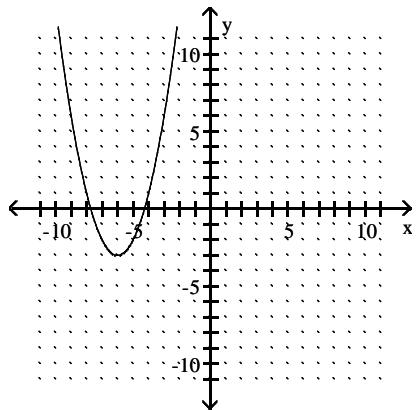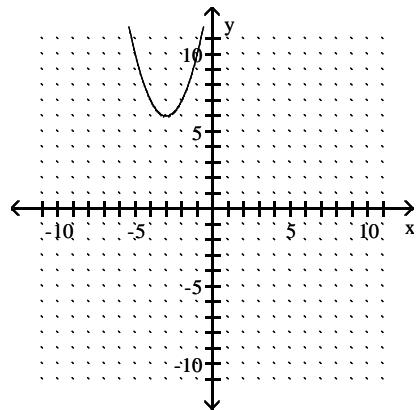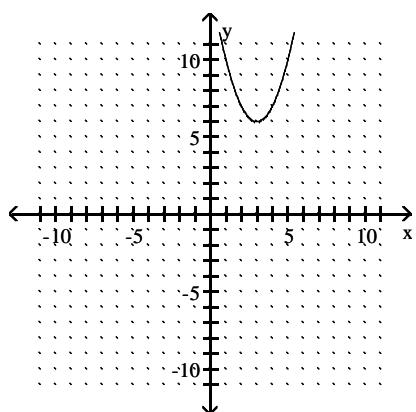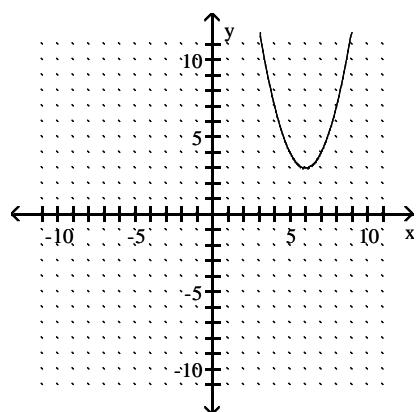
Objective: (11.1) Graph Parabola

177) $y = (x + 4)^2 + 5$

177) _____

42

A)

B)

C)

D)
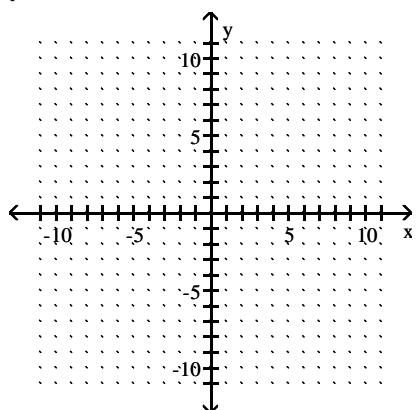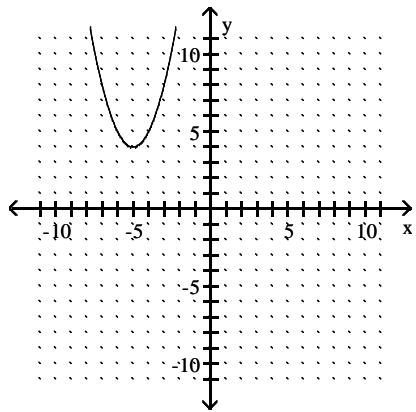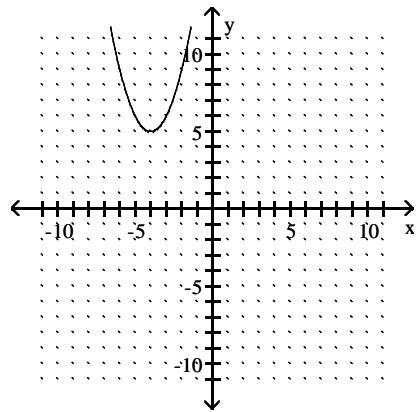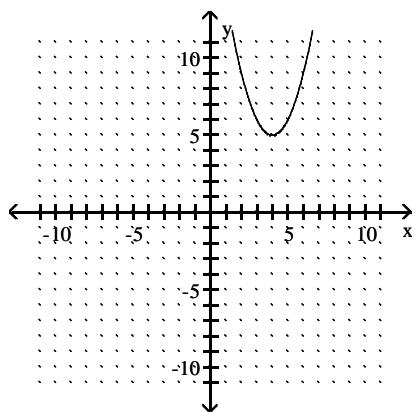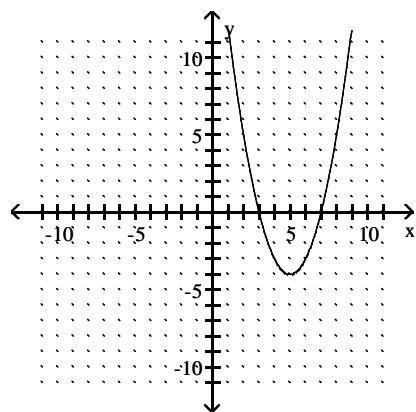
Objective: (11.1) Graph Parabola

178) $y = (x - 3)^2$

178) _____

43

A)

B)

C)

D)
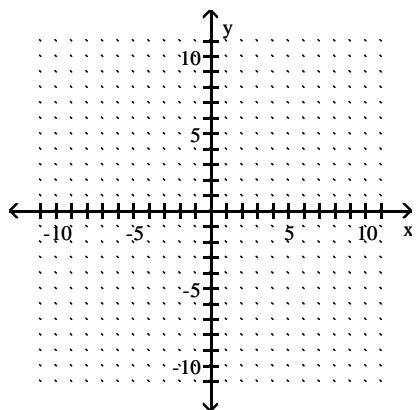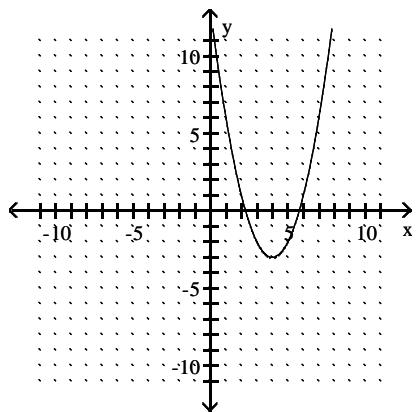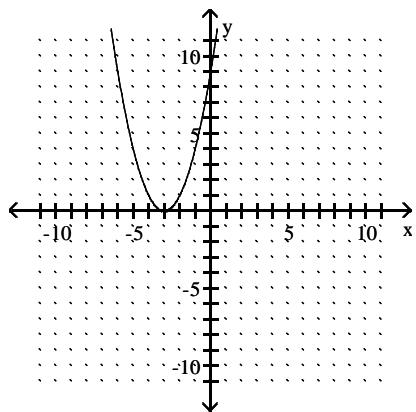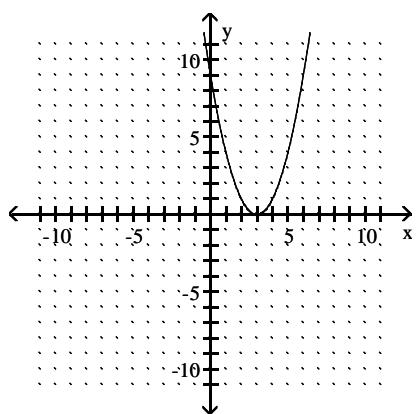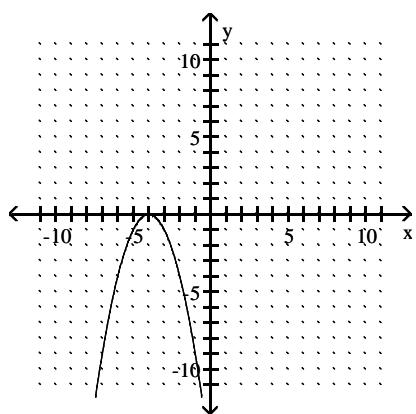
Objective: (11.1) Graph Parabola

179) $y = 3(x - 4)^2 + 6$
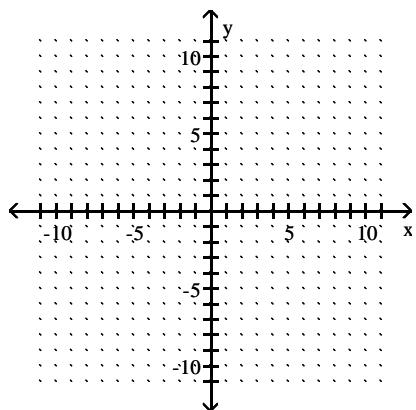
179) _____

A)

B)

C)

D)
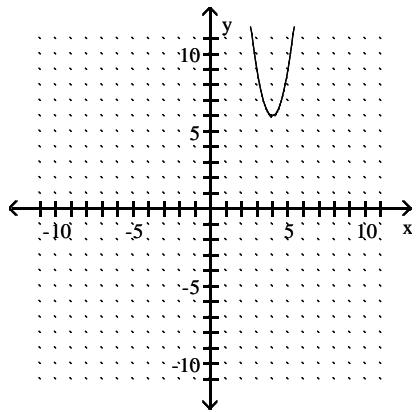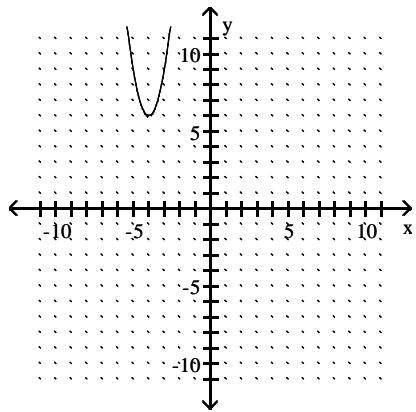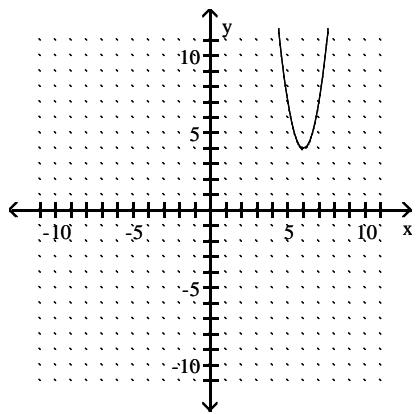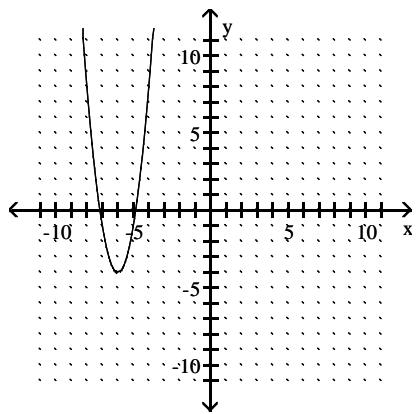

Objective: (11.1) Graph Parabola

180) $y = 3(x - 1)^2 - 5$

180) _____

A)

B)

C)

D)
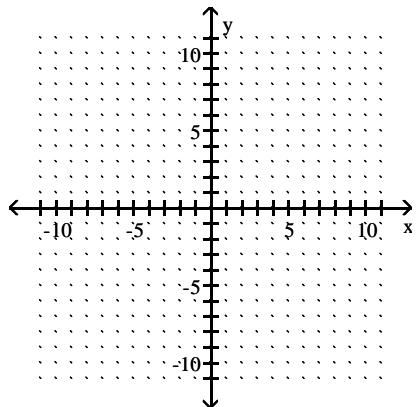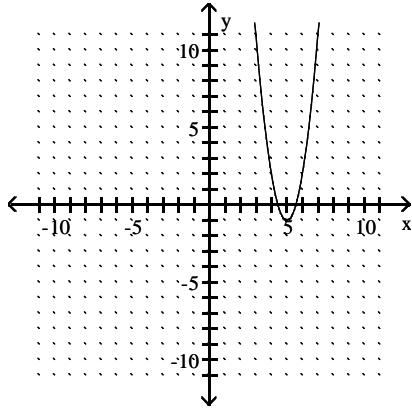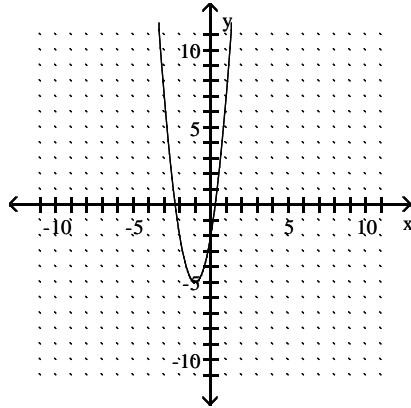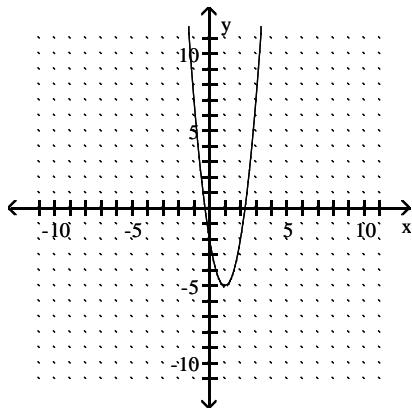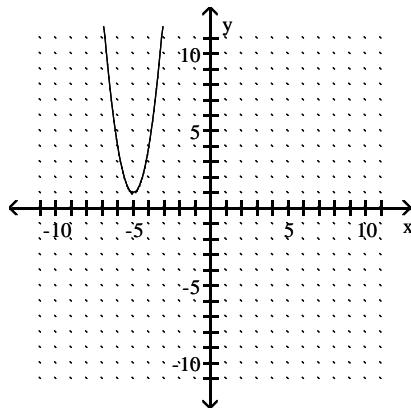
Solve the application.

181) An arrow is fired into the air with an initial velocity of 64 feet per second. The height in feet of the
arrow t seconds after it was shot into the air is given by the function $h(t) = -16t^2 + 64t$. Find the
maximum height of the arrow.

181) _____

   A) 64 feet   B) 96 feet   C) 32 feet   D) 192 feet

182) A person is standing on the top of a building 50 feet above the ground. They project an object
upward with an initial velocity of 40 feet per second. The object's distance above the ground, d,
after t seconds may be found by the formula $d = -16t^2 + 40t + 50$. What is the maximum height the
object will reach and how much time does it take to reach that height?

182) _____

   A) maximum height = 75 ft; time = 1.25 seconds
    B) maximum height = 50 ft; time = 2.5 seconds
   C) maximum height = 75 ft; time = 2.5 seconds
   D) maximum height = 50 ft; time = 1.25 seconds

1) B
2) C
3) A
4) C
5) D
6) C
7) B
8) A
9) D
10) B
11) B
12) C
13) C
14) C
15) A
16) D
17) A
18) B
19) A
20) D
21) B
22) D
23) A
24) D
25) D
26) B
27) B
28) A
29) C
30) B
31) D
32) A
33) A
34) A
35) B
36) C
37) C
38) A
39) C
40) C
41) B
42) C
43) D
44) B
45) B
46) C
47) A
48) C
49) D
50) D

51) B
52) D
53) C
54) B
55) D
56) D
57) C
58) C
59) A
60) B
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62) D
63) D
64) B
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66) C
67) A
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69) B
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71) D
72) D
73) A
74) C
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76) B
77) C
78) A
79) B
80) A
81) D
82) B
83) C
84) B
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90) B
91) A
92) B
93) C
94) D
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96) B
97) A
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99) D
100) C

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102) A
103) A
104) D
105) B
106) B
107) C
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161) C
162) A
163) B
164) B
165) C
166) B
167) B
168) B
169) D
170) A
171) A
172) D
173) A
174) B
175) A
176) C
177) B
178) C
179) A
180) C
181) A
182) A