Review problems are provided as a study preparation tool. As tests are created by different instructors, problems on current tests may differ. Sample tests are a good beginning point in your test preparation but it is recommended that you don't use these review as your only study resource. Key is provided at the last page.

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

**Write the set in interval notation and graph the interval.**

1) $\{ x \mid -1 < x \le 2 \}$

1) _____

A) $[-1, 2)$
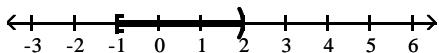
B) $(-1, 2]$
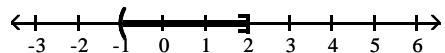
C) $(-1, 2)$
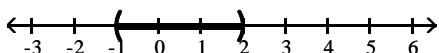
D) $[-1, 2]$
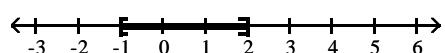
Perform the indicated operations.

2) $\dfrac{2 \cdot 3 - 3^2 \cdot 4 - 4(-1)}{-3 \cdot 4^2 + 1}$

2) _____

A) $-\dfrac{46}{47}$

B) $-\dfrac{26}{49}$

C) $\dfrac{34}{47}$

D) $\dfrac{26}{47}$

Find the square root. If the number is not real, say so.

3) $-\sqrt{64}$

3) _____

A) Not a real number

B) -8

C) 16

D) 8

Evaluate the expression for a = –5, b = 16 and c = 7.

4) $4b + \dfrac{70}{a} - \sqrt{b}$

4) _____

A) 50

B) 46

C) 328

D) 200

Solve the equation.

    5) $5(6x + 1) - 3(x - 5) = 4x + 152 + x$ 5) _____

        A) {21}   B) {6}   C) {26}   D) {11}

Solve.

    6) $-7y^2 + wy - x = 0$ for w   6) _____

        A) $w = \dfrac{x - 7y^2}{y}$ B) $w = \dfrac{7y^2 + y}{x}$ C) $w = \dfrac{x + 7y^2}{y}$ D) $w = -\dfrac{x + 7y^2}{y}$

Solve the problem.

    7) Walt made an extra $9000 last year from a part–time job. He invested part of the money at 9%   7) _____
       and the rest at 7%. He made a total of $730 in interest. How much did he invest at each rate?

        A) $4000 at 7%; $7000 at 9%   B) $5000 at 7%; $4000 at 9%
   C) $4000 at 7%; $5000 at 9%   D) $4500 at 7%; $5000 at 9%

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

8) $-\dfrac{5}{2}x > -25$

8) _____

A) $[10, \infty)$
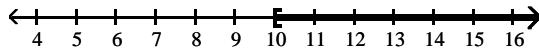
B) $(-\infty, 10]$
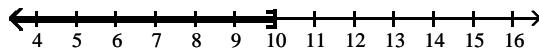
C) $(-\infty, 10)$
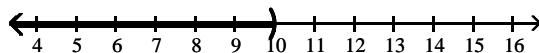
D) $(10, \infty)$
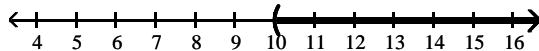
Solve the absolute value inequality.

9) $|8x - 4| < 3$

9) _____

A) $\left(-\infty, \dfrac{1}{8}\right] \cup \left[\dfrac{7}{8}, \infty\right)$ 　　　 B) $\varnothing$ 　　　 C) $\left(-\infty, \dfrac{1}{8}\right]$ 　　　 D) $\left[\dfrac{1}{8}, \dfrac{7}{8}\right]$

Solve the absolute value equation.

10) $|7k + 4| - 6 = -1$

10) _____

A) $\left\{-\dfrac{9}{7}, \dfrac{1}{7}\right\}$ 　　　 B) $\varnothing$ 　　　 C) $(-\infty, \infty)$ 　　　 D) $\left\{7, -\dfrac{7}{9}\right\}$

3

Find an equation of the line, and write it in (a) slope-intercept form if possible and (b) standard form.

11) Through $(-4, -7)$ and perpendicular to $y = \frac{1}{3}x + 17$ 11) _____

A) (a) $y = -3x - 19$

    (b) $3x + y = -19$

B) (a) $y = \frac{1}{3}x - \frac{17}{3}$

    (b) $x - 3y = 17$

C) (a) $y = 3x - 19$

    (b) $3x - y = -19$

D) (a) $y = -\frac{1}{3}x - \frac{25}{3}$

    (b) $x + 3y = -25$

Find the slope of the line through the pair of points.

12) $(-9, 2)$ and $(6, -4)$ 12) _____

A) $\frac{5}{2}$ B) $-\frac{2}{5}$ C) $\frac{2}{5}$ D) $-\frac{5}{2}$

**Graph the equation.**

13) y = 3

13) _____

A)

B)

C)

D)

5
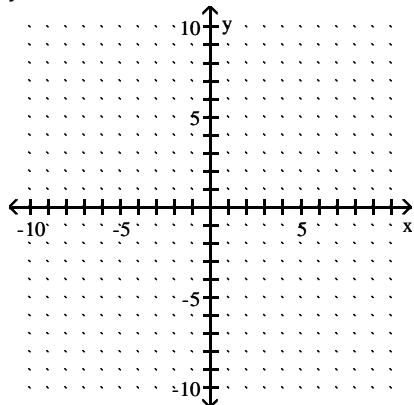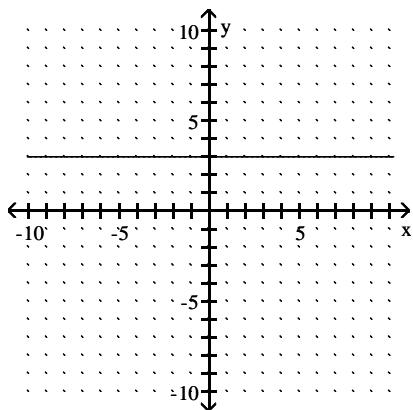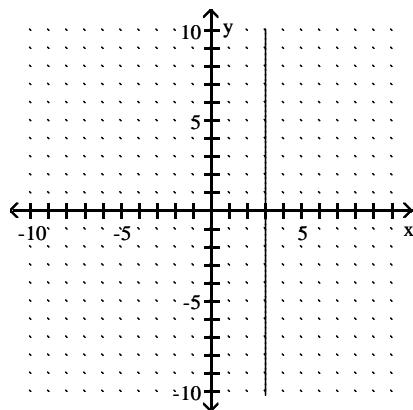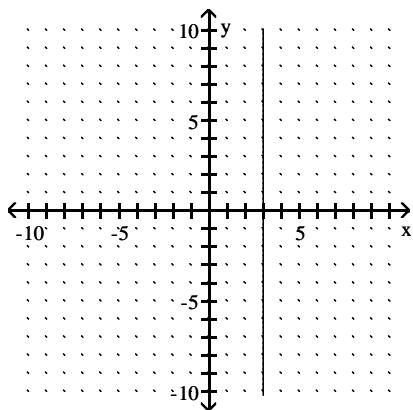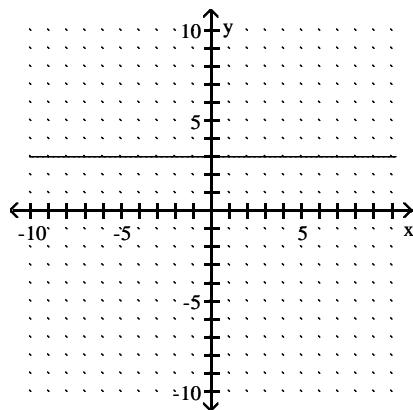
Graph the inequality or compound inequality.

14) $6x + 5y > -2$

14) _____

A)

B)

C)
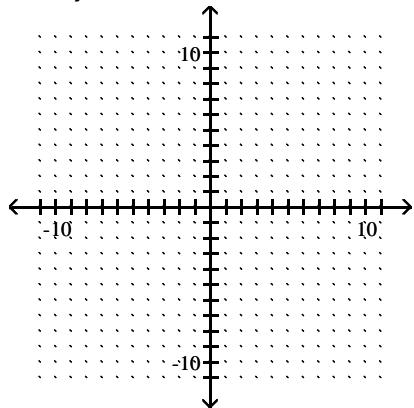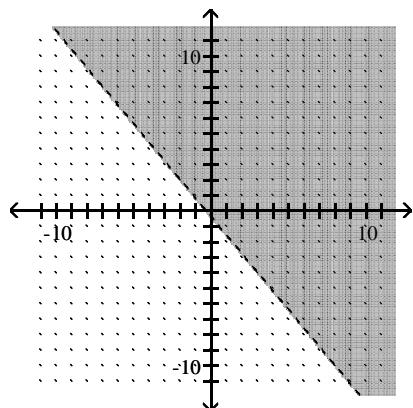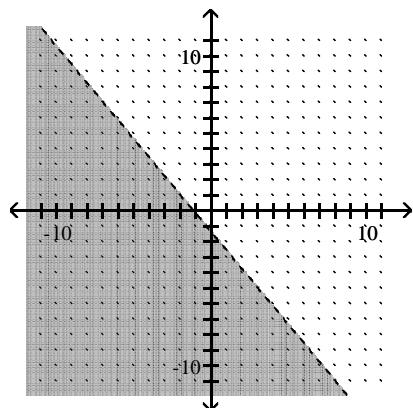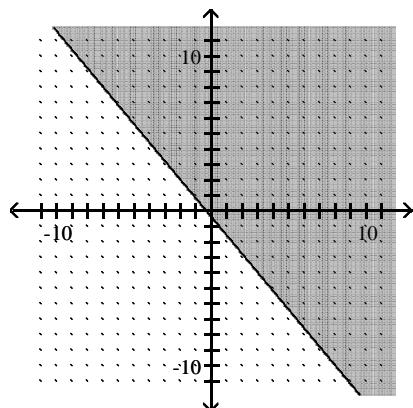
D)

Find an equation of the line, and write it in (a) slope-intercept form if possible and (b) standard form.

15) Through (3, –8); vertical

15) _____

- A) (a) $y = 3$
     (b) $y = 3$
- C) (a) not possible
     (b) $x = 3$
- B) (a) $y = -8$
     (b) $y = -8$
- D) (a) not possible
     (b) $x = -8$

Solve the absolute value inequality.

16) $|5 - 4x| \geq 6$

16) _____

- A) $\left[-\dfrac{1}{4}, \dfrac{11}{4}\right]$
- B) $\left(-\infty, -\dfrac{1}{4}\right] \cup \left[\dfrac{11}{4}, \infty\right)$

Graph the equation.

17) $7x - 4y = 28$

17) _____

A)

B)

7
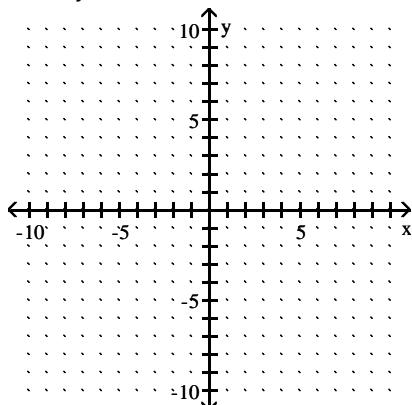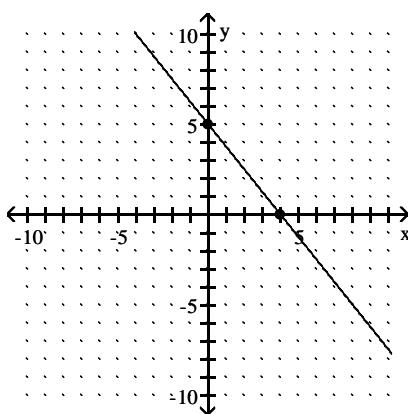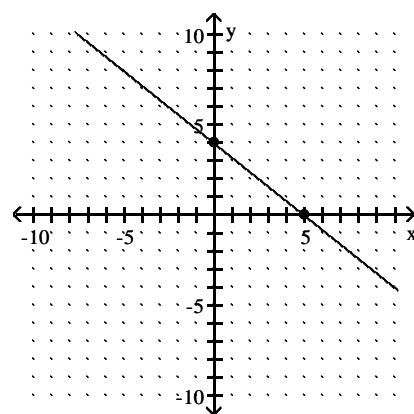
Solve the system of equations. If a system is inconsistent or has dependent equations, say so.

18) $x - 4y = -5$

$\quad\ \ 7x - 5y = -12$

18) _____

A) $\{(-1, 1)\}$ B) $\{(-1, 1)\}$

**Find an equation of the line, and write it in slope–intercept form, if possible.**

19) Through $(-8, 4)$; $m = -6$

     A) (a) $y = -6x - 44$ B) (a) $y = -6x - 44$

          (b) $6x + y = -44$ (b) $6x + y = 44$

19) _____

Solve the problem using a system of equations.

20) Chuck and Dana agree to meet in Chicago for the weekend. Chuck travels 210 miles in the same time that Dana travels 180 miles. If Chuck's rate of travel is 5 mph more than Dana's, then at what rate does Chuck travel?

     A) 35 mph   B) 30 mph

20) _____

Add or subtract as indicated.

21) $(-6x^3 + 9x^2 + 4) - (-5x^3 + 2x - 5)$

21) _____

A) $-x^3 + 9x^2 - 2x + 9$ B) $-x^6 + 9x^4 - 2x^2 + 9$

C) $-x^3 + 9x^2 + 2x - 1$ D) $-11x^3 + 9x^2 + 2x - 1$

Find the product.

22) $4ax^2(-11ax^4 + 9x^2 + 3)$

22) _____

A) $-44ax^8 + 36ax^4 + 12ax^2$ B) $44a^2x^8 - 36ax^4 - 12ax^2$

C) $44a^2x^6 - 36ax^4 - 12ax^2$ D) $-44a^2x^6 + 36ax^4 + 12ax^2$

Factor by grouping.

23) $p^2 + 7p + 5p + 35$

23) _____

A) $p(p + 35)$ B) $(p + 7)(p + 5)$ C) $(p + 7)(p - 5)$ D) $(p - 7)(p - 5)$

Factor the trinomial completely.

24) $u^2 - 2uv - 80v^2$

24) _____

    A) Prime   B) $(u + 8v)(u - 10v)$
    C) $(u - 8v)(u + v)$ D) $(u - 8v)(u + 10v)$

25) $-25x^2 + 30x + 16$

25) _____

    A) $(5x + 2)(5x + 8)$ B) $-(5x - 2)(5x + 8)$ C) $-(5x - 2)(5x - 8)$ D) $-(5x + 2)(5x - 8)$

26) $8x^2 - 28x - 16$

26) _____

    A) $(8x - 4)(x + 4)$ B) $(2x - 1)(4x + 16)$ C) $4(2x + 1)(x - 4)$ D) $4(2x - 1)(x + 4)$

Factor the polynomial completely.

27) $81k^2 - 64m^2$

27) _____

    A) $(9k + 8m)^2$ B) $(81k + m)(k - 64m)$
    C) $(9k + 8m)(9k - 8m)$ D) $(9k - 8m)^2$

Find all solutions by factoring.

28) $2k^2 = -24k - 64$

28) _____

    A) $\{8, 4\}$ B) $\{8, -4\}$ C) $\{-4, -8\}$ D) $\{-8, -16\}$

Divide.

29) $\dfrac{x^2 + 3x - 40}{x + 8}$

<div align="right">29) _____</div>

     A) $x^2 + 4x - 32$ B) $x + 5$ C) $x - 5$ D) $x^2 - 5$

Perform the indicated operation and express in lowest terms.

30) $\dfrac{6s^2 + 5st + t^2}{4s^2 - 11st - 3t^2} \cdot \dfrac{4s^2 - 13st + 3t^2}{t^2 + 2st - 3s^2} \div \dfrac{8s^2 + 2st - t^2}{4s^2 + 5st + t^2}$

<div align="right">30) _____</div>

     A) $\dfrac{(t + 2s)}{(t + s)(t - s)}$ B) 1

     C) $\dfrac{t + s}{t - s}$ D) $\dfrac{(t + 2x)^2(4x - t)^2}{(4s + t)^2(t^2 - s^2)}$

Add or subtract as indicated. Write the answer in lowest terms.

31) $\dfrac{3}{14x} - \dfrac{9}{10x^2}$

<div align="right">31) _____</div>

     A) $\dfrac{18}{70x^2}$ B) $\dfrac{3(5x - 21)}{70x^2}$ C) $-\dfrac{6}{140x^2}$ D) $\dfrac{-6}{14x + 10x^2}$

32) $\dfrac{4}{y^2 - 3y + 2} + \dfrac{6}{y^2 - 1}$

<div align="right">32) _____</div>

     A) $\dfrac{48y - 8}{(y - 1)(y + 1)(y - 2)}$ B) $\dfrac{10y - 8}{(y - 1)(y - 2)}$

     C) $\dfrac{8y - 10}{(y - 1)(y + 1)(y - 2)}$ D) $\dfrac{10y - 8}{(y - 1)(y + 1)(y - 2)}$

Solve the equation.

33) $\dfrac{x}{2x+2} = \dfrac{-2x}{4x+4} + \dfrac{2x-3}{x+1}$

    A) {3}   B) $\left\{-\dfrac{12}{5}\right\}$ C) {−3}   D) $\left\{\dfrac{3}{2}\right\}$

Simplify the complex fraction.

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

34) _____

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

Solve the problem.

35) The speed of a stream is 5 mph. If a boat travels 92 miles downstream in the same time that it takes to travel 46 miles upstream, what is the speed of the boat in still water?

35) _____

    A) 17 mph   B) 10 mph   C) 15 mph   D) 18 mph

Find the product.

36) $(5a - 6b)(8a - 3b)$

36) _____

    A) $40a^2 + 33ab + 18b^2$ B) $40a^2 - 63ab + 18b^2$
    C) $40a^2 + 63ab + 18b^2$ D) $40a^2 + 18b^2$

Factor the polynomial completely.

37) $x^3 - 27$

37) _____

    A) $(x - 3)(x^2 + 3x + 9)$ B) $(x + 3)(x^2 - 3x + 9)$
    C) $(x - 3)(x^2 + 9)$ D) $(x + 27)(x^2 - 1)$

Solve the problem.

38) A room has an area of 266 square feet. One dimension is 5 feet more than the other. Find the dimensions of the room.

38) _____

A) 14 feet, 19 feet   B) 16 feet, 21 feet   C) 9 feet, 14 feet   D) 19 feet, 24 feet

Perform the indicated operation and express in lowest terms.

39) $\dfrac{k^2 + 10k + 24}{k^2 + 14k + 48} \cdot \dfrac{k^2 + 8k}{k^2 + 2k - 8}$

39) _____

A) $\dfrac{1}{k - 2}$ B) $\dfrac{k}{k - 2}$ C) $\dfrac{k}{k^2 + 14k + 48}$ D) $\dfrac{k^2 + 8k}{k - 2}$

Solve the equation.

40) $\dfrac{2y + 3}{y} = \dfrac{3}{2}$

40) _____

A) {0}   B) {−6}   C) {6}   D) {3}

Evaluate.

41) $-\sqrt{625}$

41) _____

A) −25   B) Not a real number
C) −312   D) 25

Simplify the expression. Assume that all variables represent positive real numbers.

42) $\left(\dfrac{36}{25}\right)^{-3/2}$

42) _____

A) $\dfrac{25}{36}$ B) $\dfrac{125}{216}$ C) $\dfrac{216}{125}$ D) $\dfrac{36}{25}$

43) $\sqrt[3]{x^2} \cdot \sqrt[3]{x^8}$

43) _____

A) $x^{6/3}$ B) x^{48} C) $x^{10/3}$ D) $x^{16/3}$

Simplify. Assume that all variables represent positive real numbers.

44) $\sqrt[3]{27a^8b^5}$

44) _____

  A) $3ab\sqrt[3]{a^3b^3}$　　　B) $3ab\sqrt[3]{a^2b^2}$　　　C) $3a^2b\sqrt[3]{a^2b^2}$　　　D) $3\sqrt[3]{a^2b^2}$

45) $9\sqrt{3} + 5\sqrt{75}$

45) _____

  A) $14\sqrt{3}$　　　B) $-34\sqrt{3}$　　　C) $16\sqrt{3}$　　　D) $34\sqrt{3}$

46) $5\sqrt[3]{27x} + 5\sqrt[3]{8x}$

46) _____

  A) $5\sqrt[3]{35x}$　　　B) $25x$　　　C) $5\sqrt[3]{x}$　　　D) $25\sqrt[3]{x}$

Rationalize the denominator.

47) $\dfrac{8}{\sqrt{19}}$

47) _____

  A) $8\sqrt{19}$　　　B) $\dfrac{8\sqrt{19}}{19}$　　　C) $\dfrac{64\sqrt{19}}{19}$　　　D) 369

Write the fraction in lowest terms.

48) $\dfrac{20 + \sqrt{75}}{5}$

48) _____

  A) $20 + \sqrt{3}$　　　B) $4 + 5\sqrt{3}$　　　C) $4 + \sqrt{15}$　　　D) $4 + \sqrt{3}$

Perform the indicated operation. Give answer in standard form.

49) $(-4 + 3i) - (5 + 2i) - 13i$ 49) _____

    A) $-9 + 12i$ B) $-9 - 8i$ C) $9 - 12i$ D) $-9 - 12i$

50) $(8 + 8i)(2 + 9i)$ 50) _____

    A) $-56 - 88i$ B) $-56 + 88i$ C) $88 - 56i$ D) $72i^2 + 88i + 16$

Find the power of i.

51) i^{19} 51) _____

    A) 1 B) $-i$ C) i D) -1

Solve the equation by using the square root property.

52) $(9s + 3)^2 = 4$ 52) _____

    A) $\left\{\dfrac{1}{9}\right\}$ B) $\left\{\dfrac{1}{9}, \dfrac{5}{9}\right\}$ C) $\left\{-\dfrac{1}{9}, -\dfrac{5}{9}\right\}$ D) $\left\{-\dfrac{1}{9}, 0\right\}$

Solve the equation.

53) $x^4 - 3x^2 - 4 = 0$ 53) _____

    A) $\{2i, -2i, i, -i\}$ B) $\{2, -2, i, -i\}$ C) $\{2, -2, 1, -1\}$ D) $\{1, -1, 2i, -2i\}$

Identify the vertex of the given parabola.

54) $f(x) = -(x + 3)^2 - 7$ 54) _____

    A) $(3, 7)$ B) $(3, -7)$ C) $(-3, 7)$ D) $(-3, -7)$

14

**Solve the problem. Round your answer to the nearest tenth, when appropriate.**

55) A toy rocket is shot vertically upward from the ground. Its distance in feet from the ground in
t seconds is given by $s(t) = -16t^2 + 184t$. At what time or times will the ball be 137 ft from the
ground?

55) _____

A) 178.4 and 189.6 sec   B) 0.8 and 10.7 sec
C) 11.5 sec   D) 5.8 sec

Use the Pythagorean formula to find the exact length of side b in the figure.

56)

56) _____
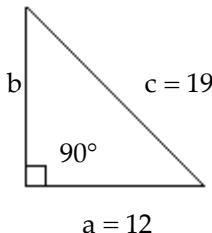
A) $b = \sqrt{505}$ B) $b = \sqrt{14}$ C) $b = \sqrt{217}$ D) $b = \sqrt{7}$

Solve this equation.

57) $\sqrt{x + 7} + 5 = x$

57) _____

A) {9, 18}   B) {2}   C) {9}   D) {2, 9}

15

Solve by using the quadratic formula.

58) $6m^2 + 12m + 1 = 0$

A) $\left\{ \dfrac{-6+\sqrt{42}}{6}, \dfrac{-6-\sqrt{42}}{6} \right\}$

B) $\left\{ \dfrac{-6+\sqrt{30}}{6}, \dfrac{-6-\sqrt{30}}{6} \right\}$

C) $\left\{ \dfrac{-6+\sqrt{30}}{12}, \dfrac{-6-\sqrt{30}}{12} \right\}$

D) $\left\{ \dfrac{-12+\sqrt{30}}{6}, \dfrac{-12-\sqrt{30}}{6} \right\}$

Solve the problem.

59) A ladder is resting against a wall. The top of the ladder touches the wall at a height of 9 ft. Find the length of the ladder if the length is 3 ft more than its distance from the wall.

   A) 12 ft   B) 9 ft   C) 15 ft   D) 18 ft

**Sketch the graph of the parabola.**

60) $y = -3(x-3)^2 - 4$

A)

B)

16

C)

D)
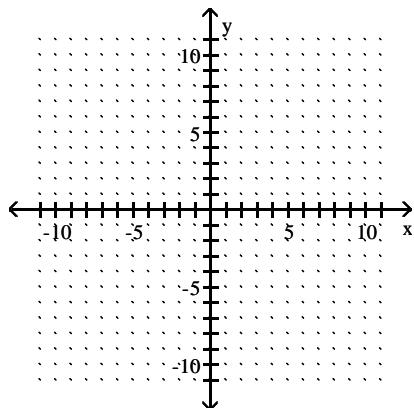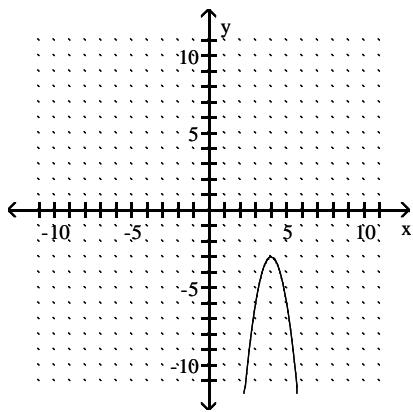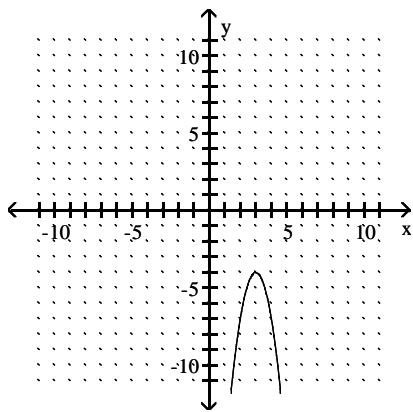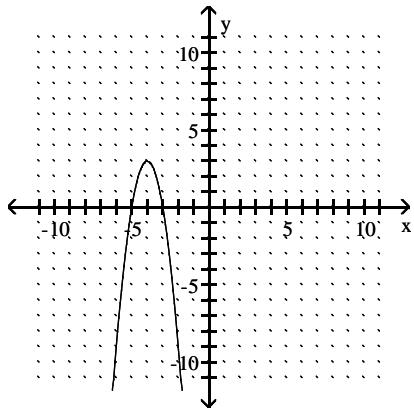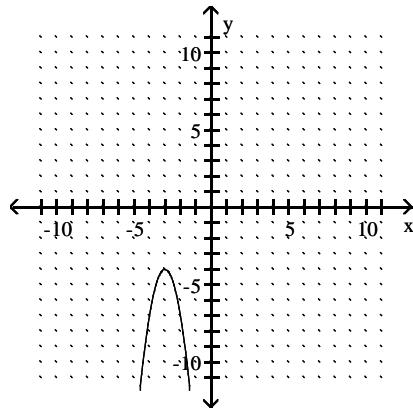
Solve the equation.

61) $3(6 + 3x) = \dfrac{1}{27}$

61) _____

A) $\{4\}$

B) $\{3\}$

C) $\left\{\dfrac{1}{9}\right\}$

D) $\{-3\}$

Graph the function.

62) $f(x) = \left(\dfrac{1}{5}\right)^x$

62) _____


A)

B)

17

C)

D)
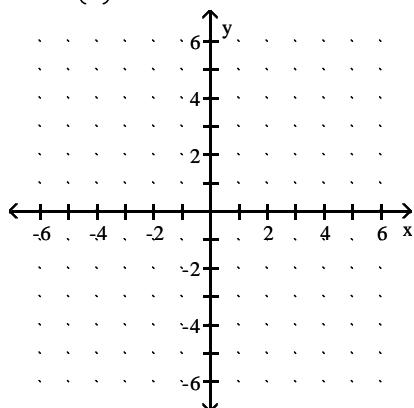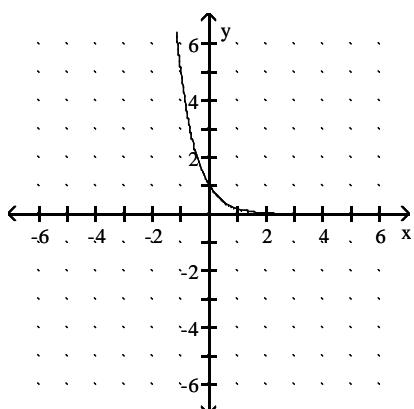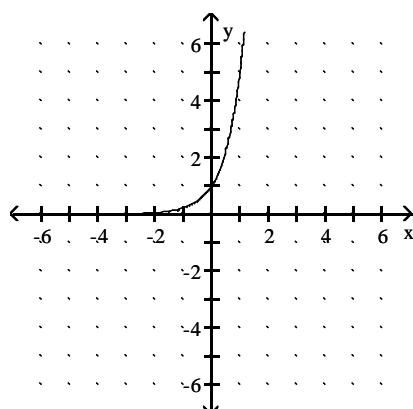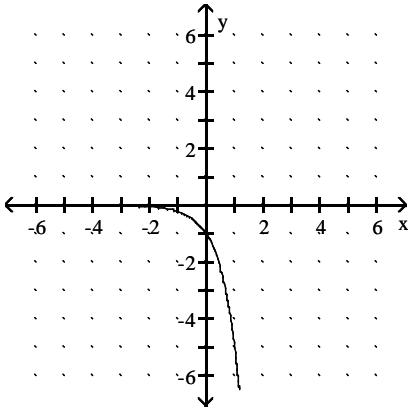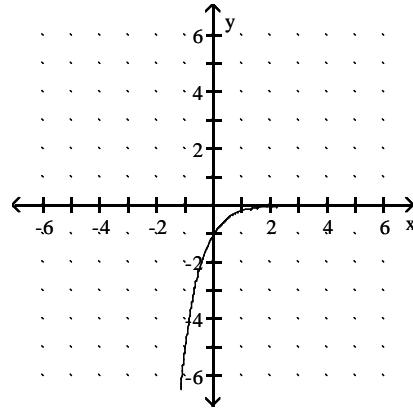
Solve the equation.

63) $\log_5 \dfrac{1}{25} = x$

A) $\left\{\dfrac{1}{125}\right\}$ B) $\left\{\dfrac{1}{5}\right\}$ C) $\{-2\}$ D) $\{2\}$

63) _____

Write in logarithmic form.

64) $4^2 = 16$

A) $\log_4 2 = 16$ B) $\log_{16} 4 = 2$ C) $\log_4 16 = 2$ D) $\log_2 16 = 4$

64) _____

Rewrite the given expression as a single logarithm. Assume that all variables are defined in such a way that variable expressions are positive and bases are positive numbers not equal to 1.

65) $(\log_q q - \log_q r) + 4 \log_q p$

A) $\log_q qp^4 r$ B) $\log_q \dfrac{4qp}{r}$ C) $\log_q \dfrac{qp^4}{r}$ D) $\log_q \dfrac{q}{p^4 r}$

65) _____

Solve the problem.

66) Coyotes are one of the few species of North American animals with an expanding range. The future population P of coyotes in a region of Mississippi can be modeled by the equation $P(t) = 43 + 18 \ln(18t + 1)$, where t is time in years. How long will it take for the population to reach 160? Round your answer to the nearest tenth, if necessary.

A) 4318 years   B) 36.9 years   C) 37 years   D) 37.1 years

66) _____

Find the logarithm. Give an approximation to four decimal places.

67) $\ln(4.03 \times e^{-5})$

A) 6.3938   B) −3.6062   C) 1.3938   D) 1.3954

67) _____

Solve the problem.

68) How long will it take a sample of radioactive substance to decay to half of its original amount, if it decays according to the function $A(t) = 350e^{-0.221t}$, where t is the time in years? Round your answer to the nearest hundredth year.

A) 77.35 yr   B) 3.14 yr   C) 26.51 yr   D) 29.64 yr

68) _____

69) Find the amount of money in an account after 5 years if $1800 is deposited at 4% annual interest compounded semiannually.

69) _____

    A) $2194.19   B) $2189.98   C) $2197.79   D) $2196.34

Solve the equation. Give the solution to three decimal places.

70) $5^{-5x-1} = 18$

70) _____

    A) {−0.159}   B) {−0.920}   C) {−0.456}   D) {−0.559}

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

50) B
51) B
52) C
53) B
54) D
55) B
56) C
57) C
58) B
59) C
60) B
61) D
62) A
63) C
64) C
65) C
66) B
67) B
68) B
69) A
70) D