

Name _____

Factor out the GCF from the polynomial.

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

2) $2(x + 5)^5 + 13(x + 5)^7$ 2) _____

3) $4(x + 5)^2 + 15(x + 5)^4$ 3) _____

4) $10(x + 5)^5 - 3(x + 5)^7$ 4) _____

5) $30(m - 9)^9 + 30(m - 9)^6 + 15(m - 9)^4$ 5) _____

6) $16(m - 9)^6 + 16(m - 9)^4 + 20(m - 9)^2$ 6) _____

7) $20(m - 9)^8 - 16(m - 9)^6 - 4(m - 9)^3$ 7) _____

Factor the given trinomial and then fully simplify

8) $(c + 3)^2 - (c + 3) - 20$ 8) _____

9) $(a + 2)^2 - (a + 2) - 12$

9) _____

10) $(a + 1)^2 - (a + 1) - 6$

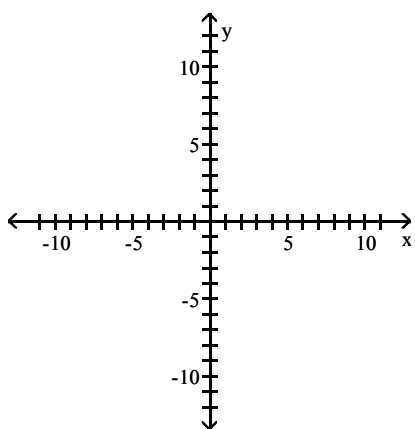
10) _____

Graph the function.

11)

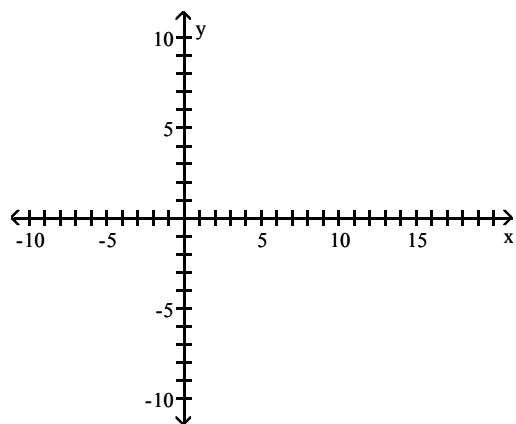
$$f(x) = \begin{cases} x + 2 & \text{if } -9 \leq x < 5 \\ -4 & \text{if } x = 5 \\ -x + 6 & \text{if } x > 5 \end{cases}$$

11) _____



12)

$$f(x) = \begin{cases} 1 & \text{if } -2 \leq x < 4 \\ |x| & \text{if } 4 \leq x < 7 \\ \sqrt{x} & \text{if } 7 \leq x \leq 12 \end{cases}$$



12) _____

Find the domain of the function.

13)

$$f(x) = \begin{cases} 5x & \text{if } x \neq 0 \\ 1 & \text{if } x = 0 \end{cases}$$

13) _____

14)

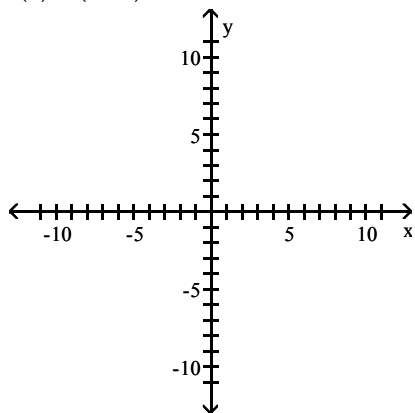
$$f(x) = \begin{cases} 1 & \text{if } -6 \leq x < -1 \\ |x| & \text{if } -1 \leq x < 6 \\ \sqrt[3]{x} & \text{if } 6 \leq x \leq 18 \end{cases}$$

14) _____

Graph the function by starting with the graph of the basic function and then using the techniques of shifting, compressing, stretching, and/or reflecting.

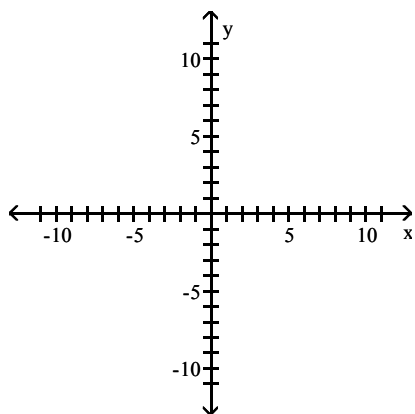
15) $f(x) = (x - 1)^3 + 3$

15) _____



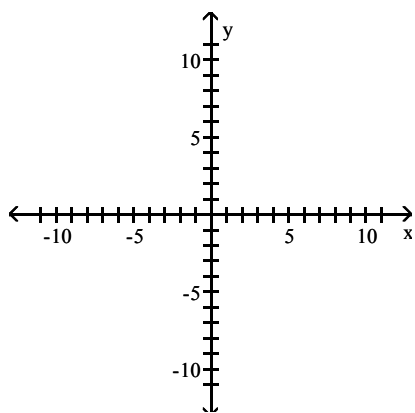
16) $f(x) = (x + 6)^3 + 5$

16) _____

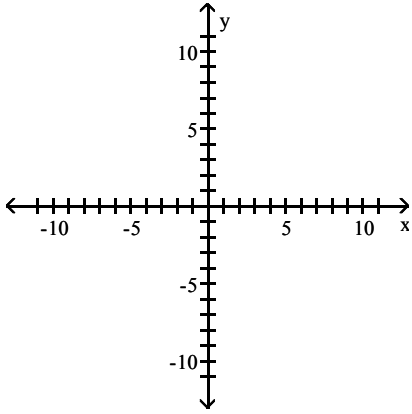


17) $f(x) = \sqrt{x} - 3$

17) _____

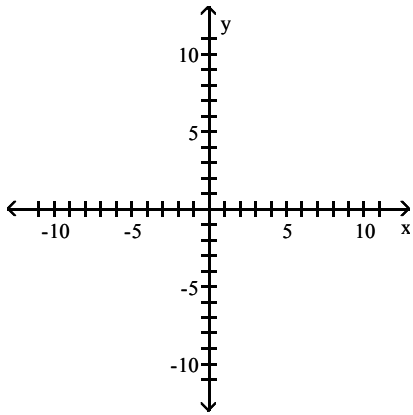


18) $f(x) = \sqrt{x} + 5$



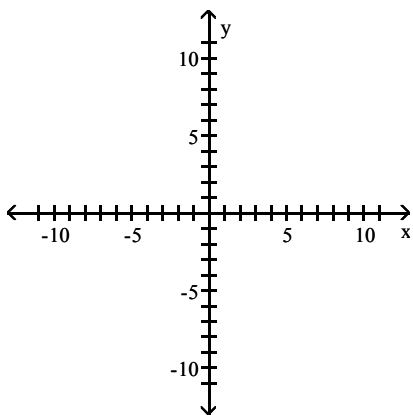
18) _____

19) $f(x) = \sqrt{x+2} - 6$



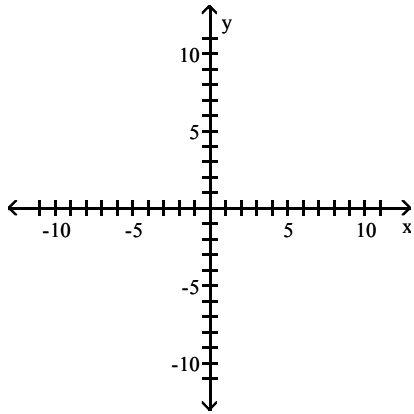
19) _____

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



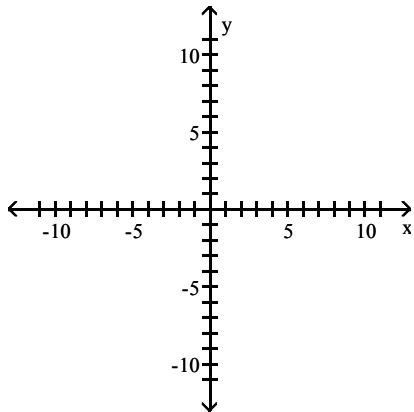
20) _____

21) $f(x) = |x| - 1$



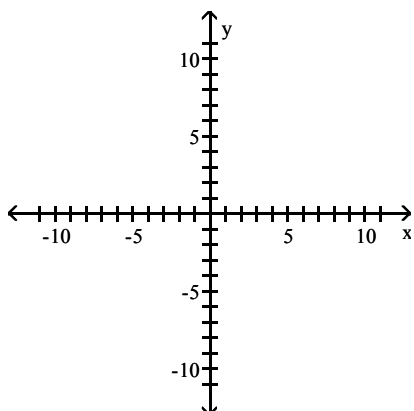
21) _____

22) $f(x) = |x| + 1$



22) _____

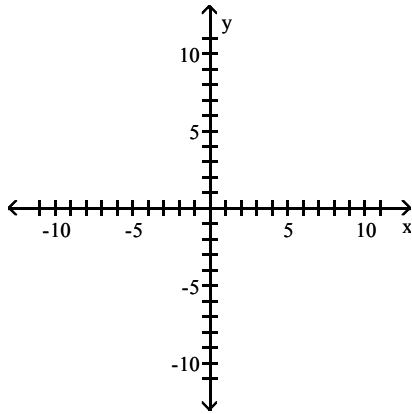
23) $f(x) = |x - 4| - 6$



23) _____

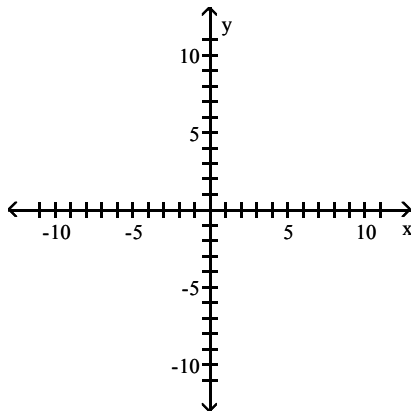
24) $f(x) = |x - 3| - 3$

24) _____



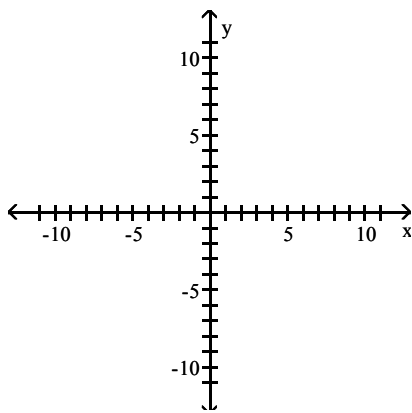
25) $f(x) = \frac{1}{x} + 4$

25) _____



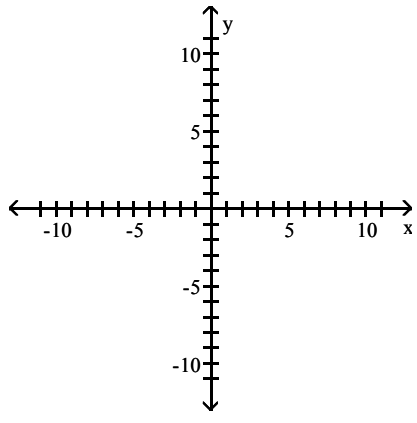
26) $f(x) = \frac{1}{x} + 1$

26) _____



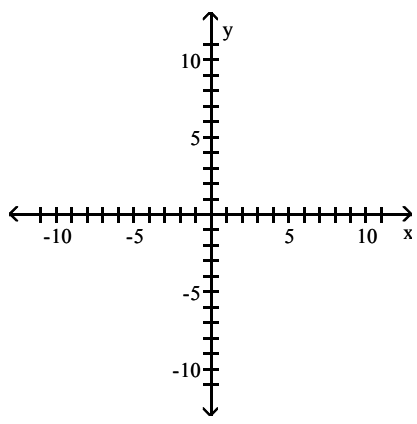
27) $f(x) = \frac{1}{x+4}$

27) _____

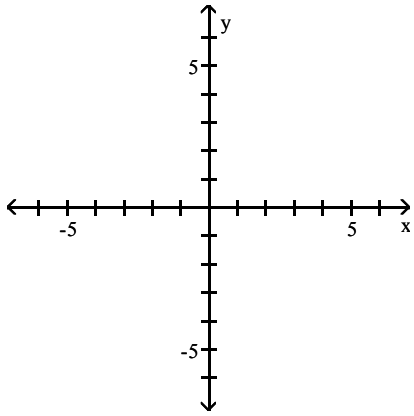


28) $f(x) = \frac{1}{x+5}$

28) _____

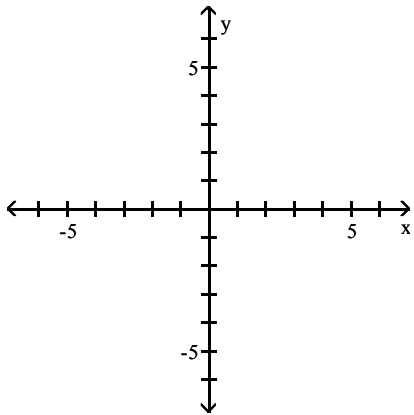


29) $f(x) = 3x^2$



29) _____

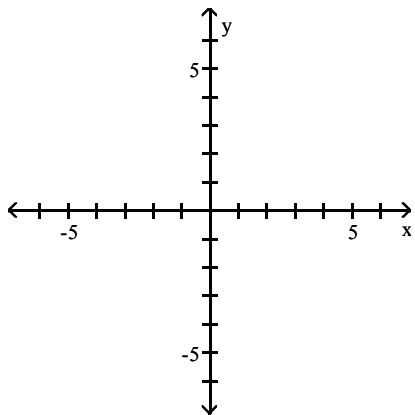
30) $f(x) = 2x^2$



30) _____

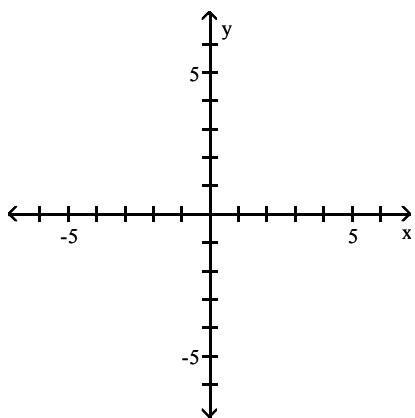
31) $f(x) = \frac{1}{2}x^2$

31) _____

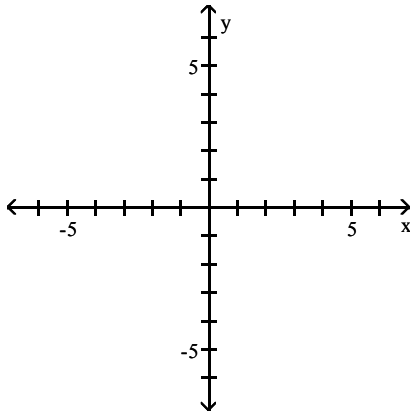


32) $f(x) = \frac{1}{7}x^2$

32) _____

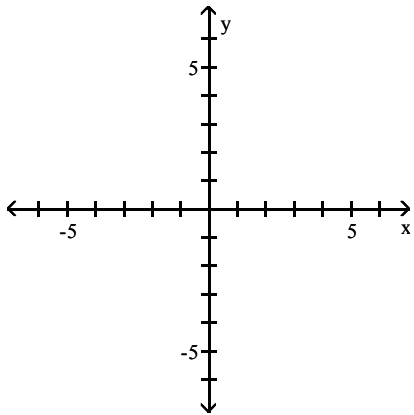


33) $f(x) = 2x^3$



33) _____

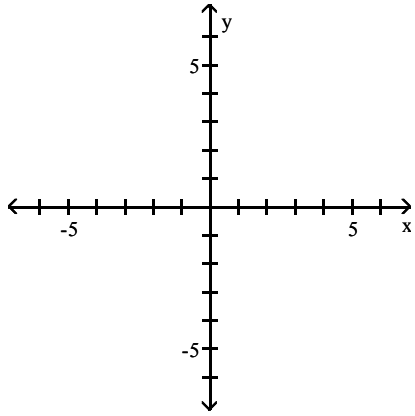
34) $f(x) = 3x^3$



34) _____

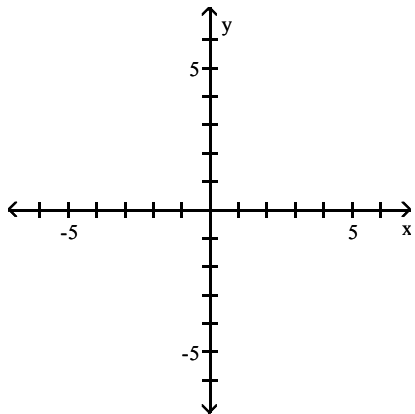
35) $f(x) = 7\sqrt{x}$

35) _____

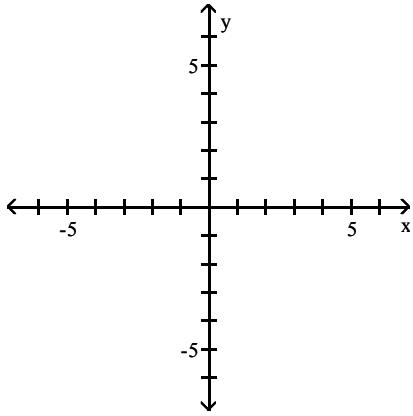


36) $f(x) = 5\sqrt{x}$

36) _____

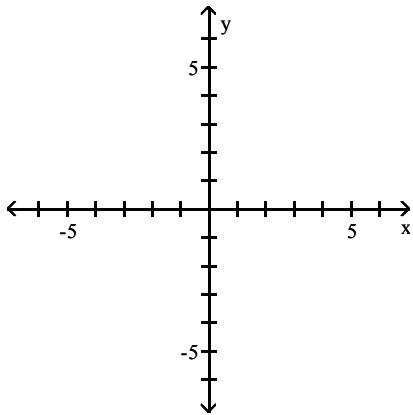


37) $f(x) = 4|x|$



37) _____

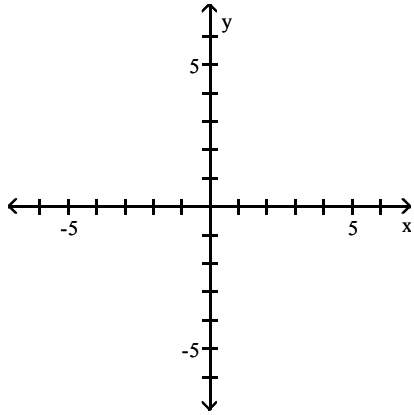
38) $f(x) = 7|x|$



38) _____

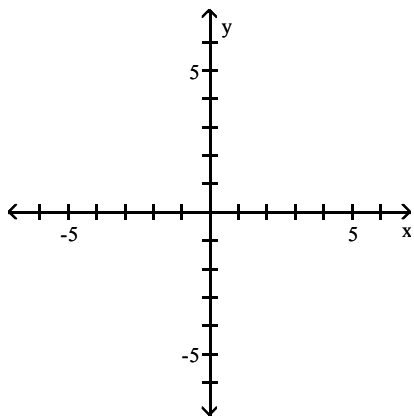
39) $f(x) = \frac{5}{x}$

39) _____



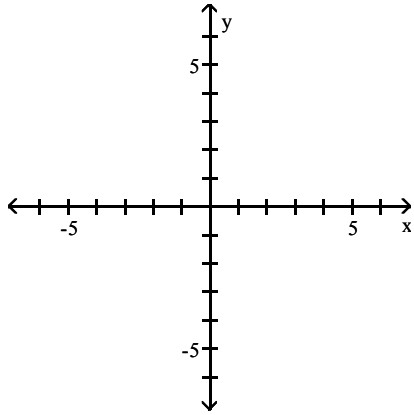
40) $f(x) = \frac{4}{x}$

40) _____



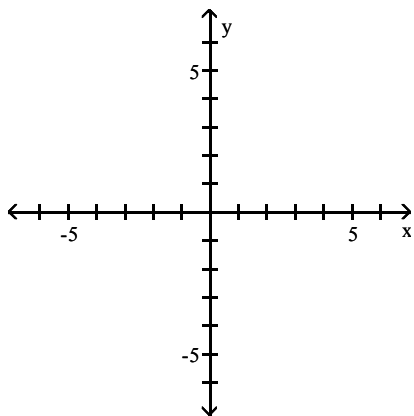
41) $f(x) = \frac{1}{6x}$

41) _____



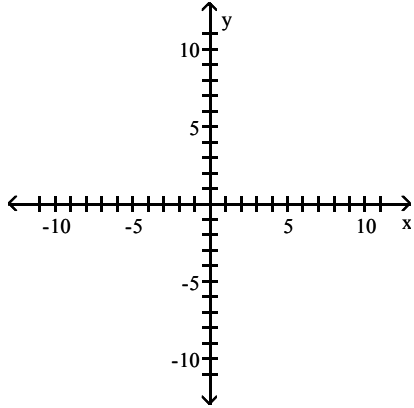
42) $f(x) = \frac{1}{2x}$

42) _____



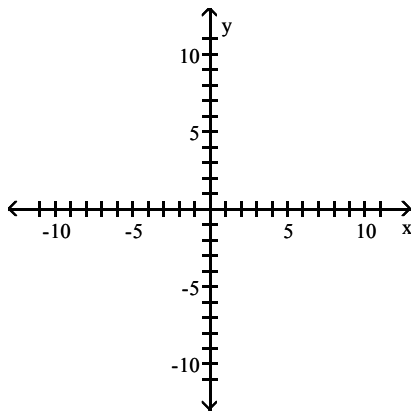
43) $f(x) = 2(x + 1)^2 - 4$

43) _____



44) $f(x) = 2(x + 1)^2 + 4$

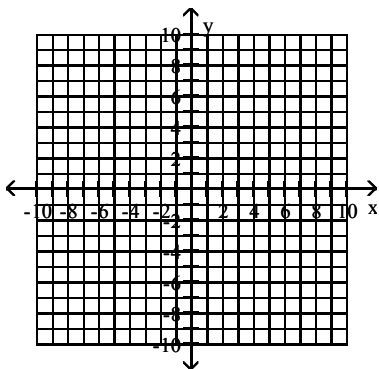
44) _____



Begin by graphing the standard quadratic function $f(x) = x^2$. Then use transformations of this graph to graph the given function.

45) $h(x) = -(x + 2)^2$

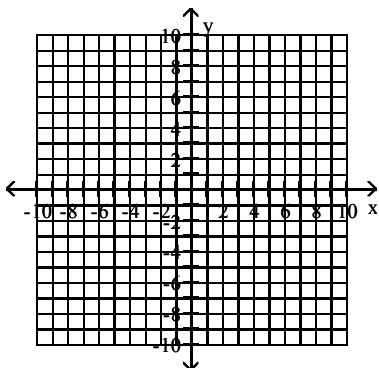
45) _____



Begin by graphing the standard absolute value function $f(x) = |x|$. Then use transformations of this graph to graph the given function.

46) $h(x) = -|x + 4|$

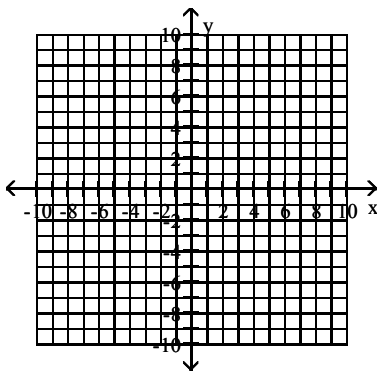
46) _____



Begin by graphing the standard cubic function $f(x) = x^3$. Then use transformations of this graph to graph the given function.

47) $g(x) = -x^3 + 3$

47) _____



Determine if the function is even, odd, or neither.

48) $f(x) = -8x^4 - 7x + 7$

48) _____

49) $f(x) = \frac{-7}{x^2 + 4}$

49) _____

50) $f(x) = -5x^5 + 6x^3$

50) _____

Find the indicated composite for the pair of functions.

51) $f(x) = -2x + 3$; $g(x) = 5x + 3$

Find $(g \circ f)(x)$.

51) _____

52) $f(x) = -5x + 6$; $g(x) = 2x + 3$

Find $(g \circ f)(x)$.

52) _____

53) $f(x) = \frac{x-5}{7}$; $g(x) = 7x + 5$

53) _____

Find $(g \circ f)(x)$

54) $f(x) = \frac{x-3}{8}$; $g(x) = 8x + 3$

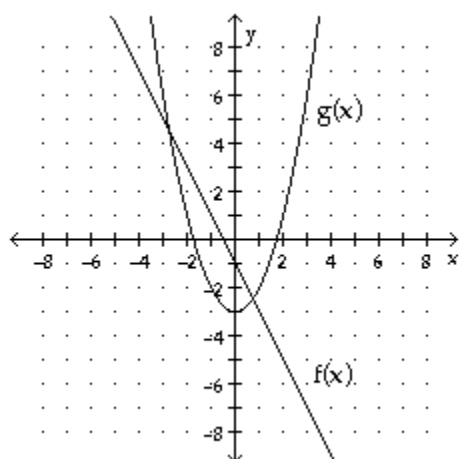
54) _____

Find $(g \circ f)(x)$

Use the graph to evaluate the expression.

55) $(f \circ g)(1)$

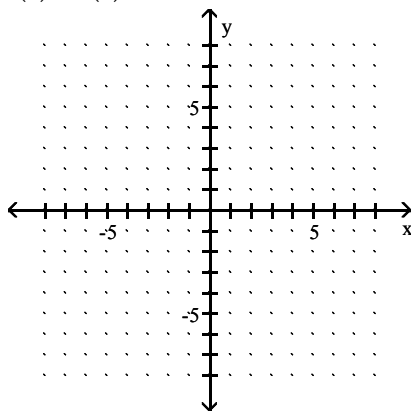
55) _____



Sketch the graph of the given function, its inverse, and $y = x$ on the same set of axes. Graph the function with a solid line, and graph $y = x$ and the function's inverse using dotted lines.

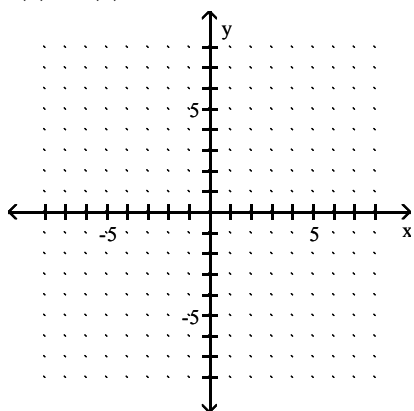
56) $f(x) = 2(3)^x$

56) _____



57) $f(x) = 3(5)^x$

57) _____



For the given functions f and g , find the requested composite function.

58) $f(x) = 3x + 5$, $g(x) = 3x - 1$; Find $(f \circ g)(x)$.

58) _____

59) $f(x) = 8x + 13$, $g(x) = 2x - 1$; Find $(f \circ g)(x)$.

59) _____

60) $f(x) = \frac{7}{x-8}$, $g(x) = \frac{8}{3x}$; Find $(f \circ g)(x)$.

60) _____

61) $f(x) = \frac{5}{x-8}$, $g(x) = \frac{3}{5x}$; Find $(f \circ g)(x)$.

61) _____

62) $f(x) = \frac{x-3}{2}$, $g(x) = 2x+3$; Find $(g \circ f)(x)$.

62) _____

63) $f(x) = \frac{x-9}{10}$, $g(x) = 10x+9$; Find $(g \circ f)(x)$.

63) _____

Find the domain of the composite function $f \circ g$.

64) $f(x) = \frac{5}{x-10}$; $g(x) = \sqrt{x-5}$

64) _____

65) $f(x) = \frac{2}{x-6}$; $g(x) = \sqrt{x-2}$

65) _____

66) $f(x) = \frac{x}{x+7}$; $g(x) = \frac{14}{x+3}$

66) _____

67) $f(x) = \frac{x}{x+7}$; $g(x) = \frac{21}{x+5}$

67) _____

68) $f(x) = \sqrt{2-x}$; $g(x) = |2x-1|$

68) _____

Find the domain of the composite function $f \circ g$.

69) $f(x) = \frac{6}{x+10}$, $g(x) = x + 2$

69) _____

70) $f(x) = \frac{5}{x+6}$, $g(x) = x + 5$

70) _____

71) $f(x) = \frac{5}{x+7}$, $g(x) = \frac{42}{x}$

71) _____

72) $f(x) = \frac{2}{x+6}$, $g(x) = \frac{18}{x}$

72) _____

73) $f(x) = 4x + 16$; $g(x) = \sqrt{x}$

73) _____

74) $f(x) = 3x + 15$; $g(x) = \sqrt{x}$

74) _____

Indicate whether the function is one-to-one.

75) $\{(-16, 17), (-20, -5), (-14, -15)\}$

75) _____

76) $\{(-20, -15), (-13, -15), (18, -20)\}$

76) _____

77) $\{(-2, 6), (-1, 6), (0, 8), (1, 4)\}$

77) _____

78) $\{(6, -12), (-5, -11), (-7, -10), (-9, -9)\}$

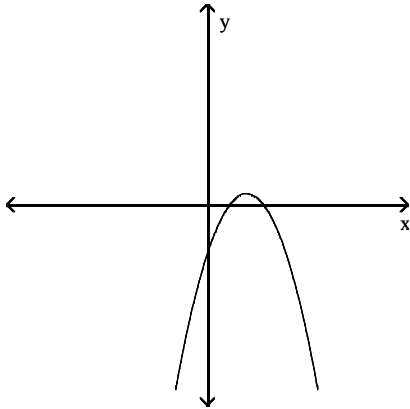
78) _____

79) $\{(1, -8), (8, -1), (-5, 5), (5, -5)\}$

79) _____

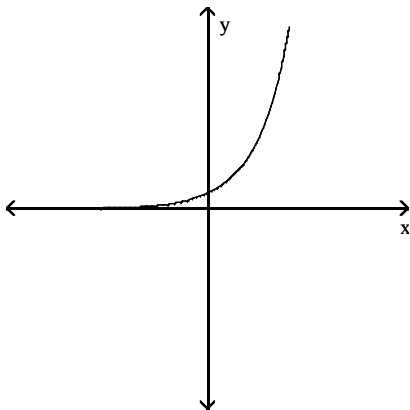
Use the horizontal line test to determine whether the function is one-to-one.

80)



80) _____

81)



81) _____

Find the inverse of the function and state its domain and range .

82) $\{(10, -8), (8, -7), (6, -6), (4, -5)\}$

82) _____

83) $\{(-9, 2), (-2, 9), (-5, -4), (5, 4)\}$

83) _____

84) $\{(-3, 4), (-1, 5), (0, 2), (2, 6), (5, 7)\}$

84) _____

Find the inverse. Determine whether the inverse represents a function.

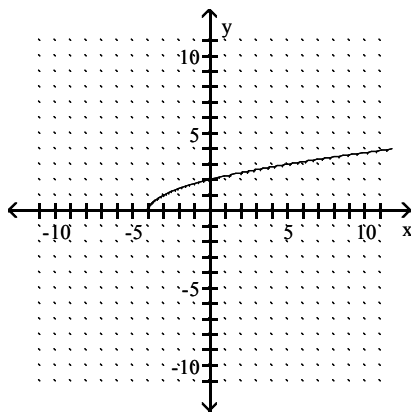
85) $\{(6, 2), (9, 3), (7, 4), (5, 5)\}$

85) _____

The graph of a one-to-one function f is given. Draw the graph of the inverse function f^{-1} as a dashed line or curve.

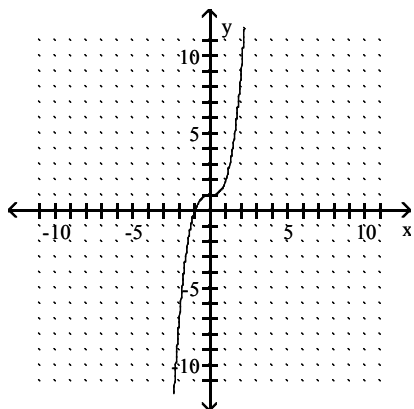
86) $f(x) = \sqrt{x+4}$

86) _____



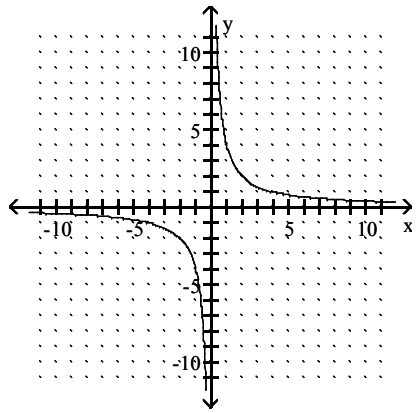
87) $f(x) = x^3 + 1$

87) _____



88) $f(x) = \frac{4}{x}$

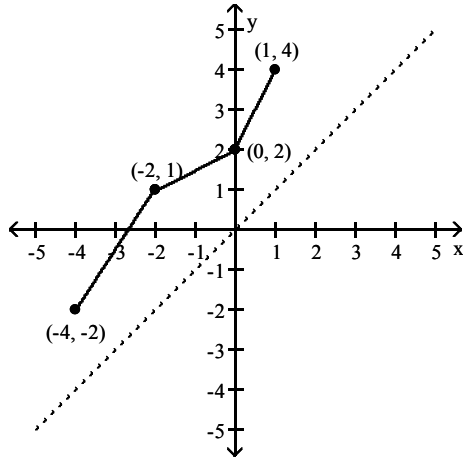
88) _____



Use the graph of the given one-to-one function to sketch the graph of the inverse function. For convenience, the graph of $y = x$ is also given.

89)

89) _____



Decide whether or not the functions are inverses of each other.

90) $f(x) = 2x - 9$, $g(x) = \frac{x+2}{9}$

90) _____

91) $f(x) = 2x + 4$, $g(x) = \frac{1}{2}x - 2$

91) _____

$$92) f(x) = 8x - 8, g(x) = \frac{1}{8}x + 1$$

92) _____

$$93) f(x) = 5x^2 + 9, g(x) = \sqrt{\frac{x-9}{5}}$$

93) _____

$$94) f(x) = (x-3)^2, x \geq 3; g(x) = \sqrt{x} + 3$$

94) _____

$$95) f(x) = (x-4)^2, x \geq 4; g(x) = \sqrt{x+4}$$

95) _____

$$96) f(x) = \frac{2}{x+4}, g(x) = \frac{4x+2}{x}$$

96) _____

$$97) f(x) = \frac{2+x}{x}, g(x) = \frac{2}{x-1}$$

97) _____

$$98) f(x) = \sqrt{x+2}, \text{ domain } [-2, \infty); g(x) = x^2 + 2, \text{ domain } (-\infty, \infty)$$

98) _____

$$99) f(x) = x^3 - 6, g(x) = \sqrt[3]{x+6}$$

99) _____

Determine i) the domain of the function, ii) the range of the function, iii) the domain of the inverse, and iv) the range of the inverse.

$$100) f(x) = \frac{2}{x+3}$$

100) _____

$$101) f(x) = \sqrt{5x-3}$$

101) _____

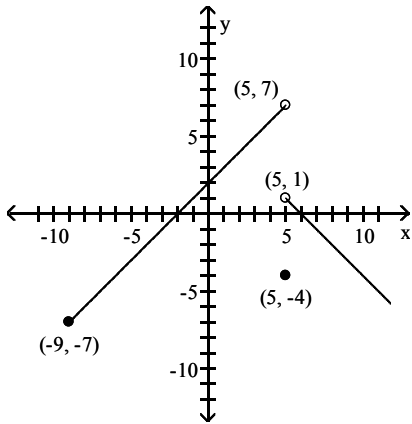
$$102) f(x) = \sqrt{1+2x}$$

102) _____

Answer Key

Testname: EXAM 2PREPARATION CH1 & CH 2V02

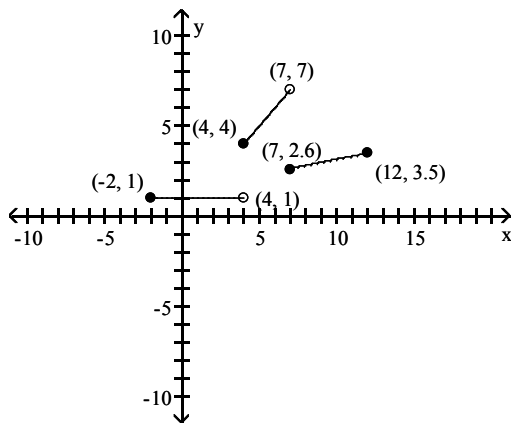
- 1) $4(x + 5)^4 - 3(x + 5)^6$
 $(x + 5)^4[4 - 3(x + 5)^2]$
- 2) $2(x + 5)^5 + 13(x + 5)^7$
 $(x + 5)^5[2 + 13(x + 5)^2]$
- 3) $4(x + 5)^2 + 15(x + 5)^4$
 $(x + 5)^2[4 + 15(x + 5)^2]$
- 4) $10(x + 5)^5 - 3(x + 5)^7$
 $(x + 5)^5[10 - 3(x + 5)^2]$
- 5) $30(m - 9)^9 + 30(m - 9)^6 + 15(m - 9)^4$
 $15(m - 9)^4[2(m - 9)^5 + 2(m - 9)^2 + 1]$
- 6) $16(m - 9)^6 + 16(m - 9)^4 + 20(m - 9)^2$
 $4(m - 9)^2[4(m - 9)^4 + 4(m - 9)^2 + 5]$
- 7) $20(m - 9)^8 - 16(m - 9)^6 - 4(m - 9)^3$
 $4(m - 9)^3[5(m - 9)^5 - 4(m - 9)^3 - 1]$
- 8) $(c + 3)^2 - (c + 3) - 20$
 $[(c + 3) + -5] [(c + 3) + 4]$
 $[c - 2][c + 7]$
- 9) $(a + 2)^2 - (a + 2) - 12$
 $[(a + 2) + -4] [(a + 2) + 3]$
 $[a - 2][a + 5]$
- 10) $(a + 1)^2 - (a + 1) - 6$
 $[(a + 1) + -3] [(a + 1) + 2]$
 $[a - 2][a + 3]$
- 11)



Answer Key

Testname: EXAM 2PREPARATION CH1 & CH 2V02

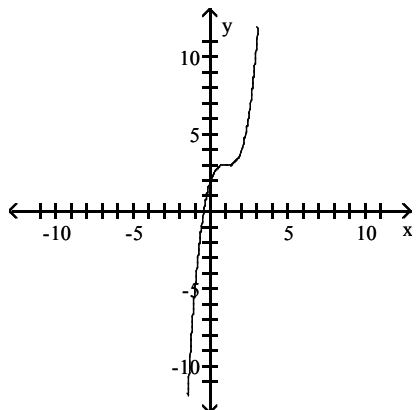
12)



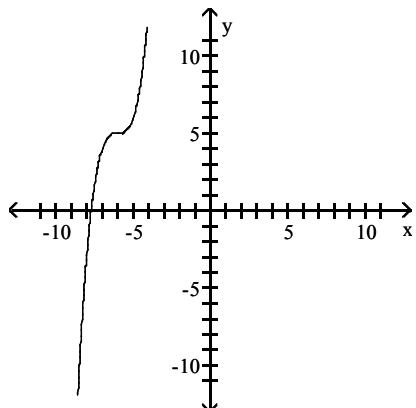
13) all real numbers

14) $\{x \mid -6 \leq x \leq 18\}$

15)



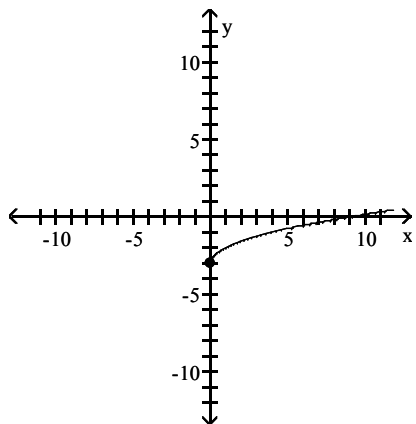
16)



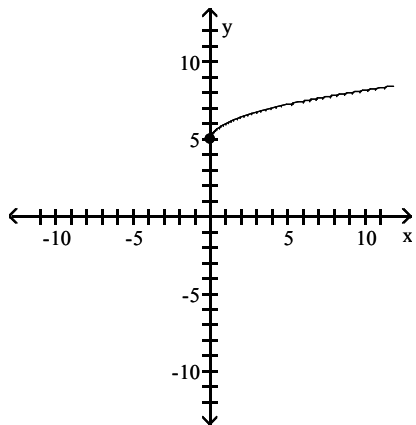
Answer Key

Testname: EXAM 2PREPARATION CH1 & CH 2V02

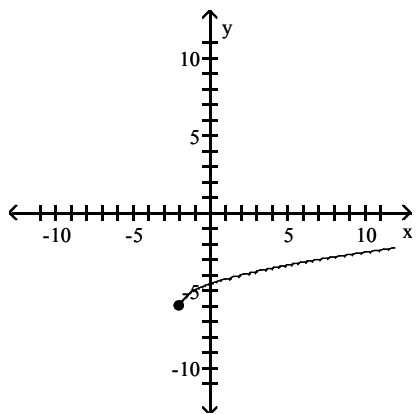
17)



18)



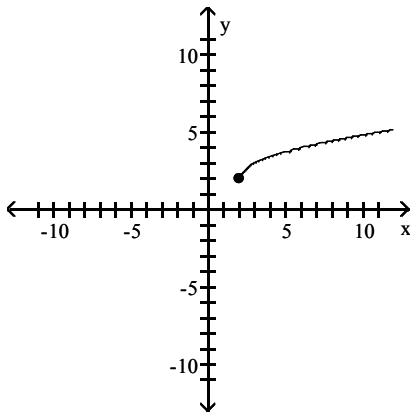
19)



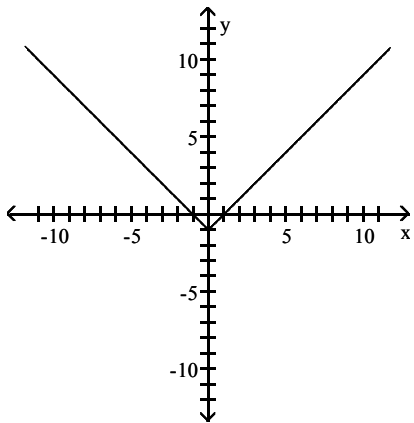
Answer Key

Testname: EXAM 2PREPARATION CH1 & CH 2V02

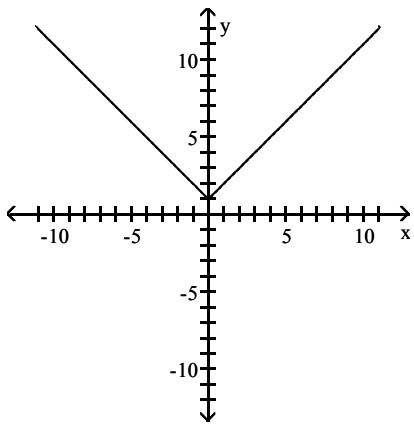
20)



21)



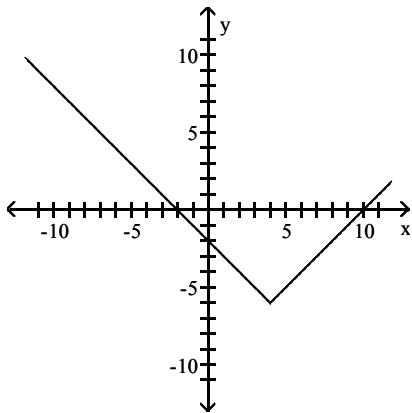
22)



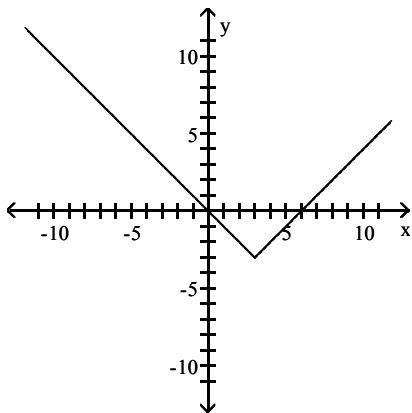
Answer Key

Testname: EXAM 2PREPARATION CH1 & CH 2V02

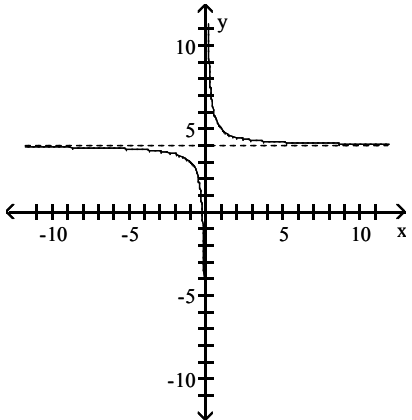
23)



24)



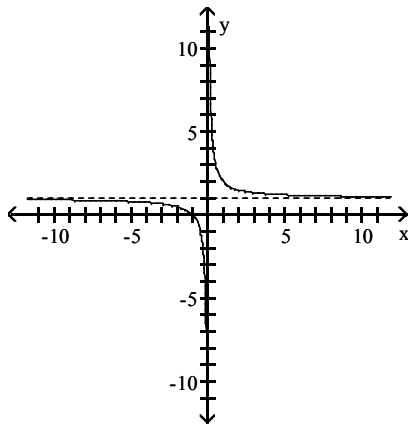
25)



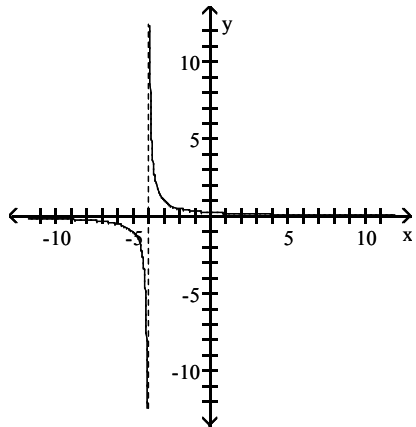
Answer Key

Testname: EXAM 2PREPARATION CH1 & CH 2V02

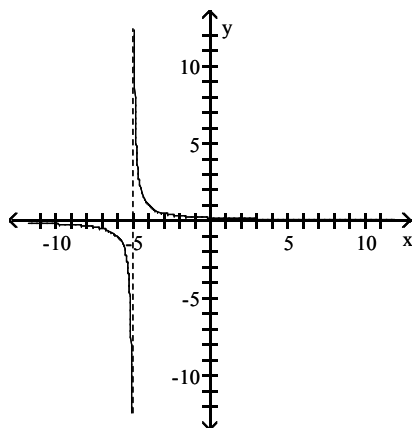
26)



27)



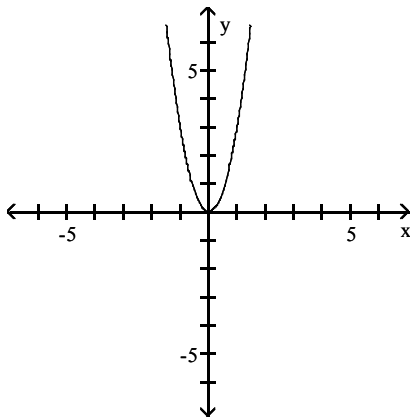
28)



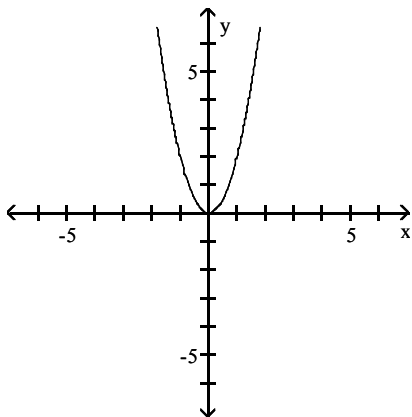
Answer Key

Testname: EXAM 2PREPARATION CH1 & CH 2V02

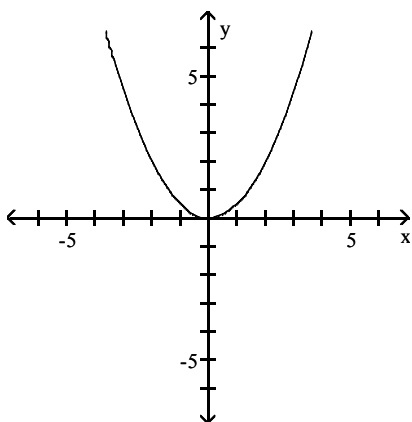
29)



30)



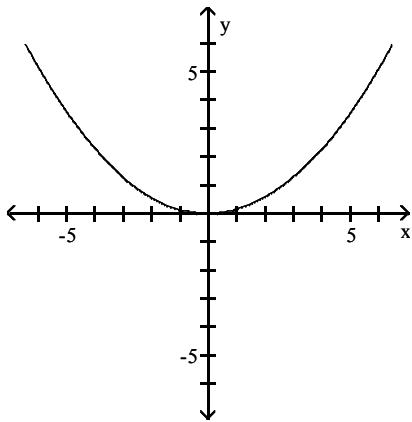
31)



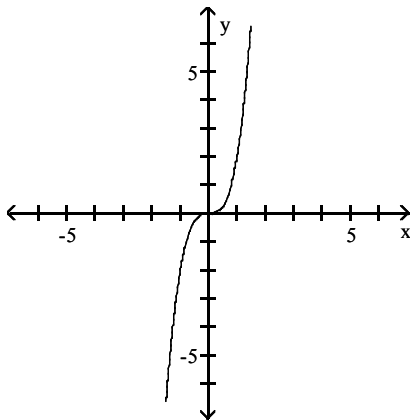
Answer Key

Testname: EXAM 2PREPARATION CH1 & CH 2V02

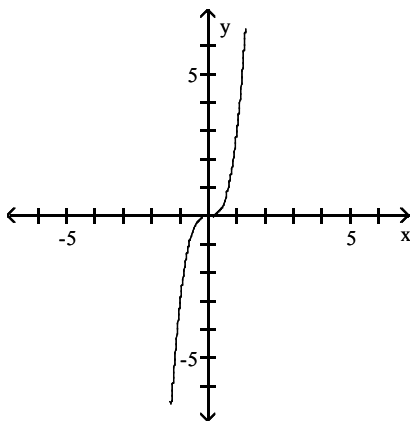
32)



33)



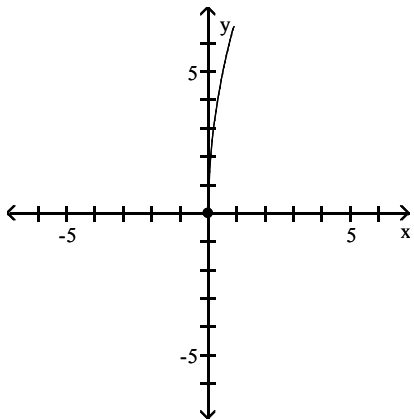
34)



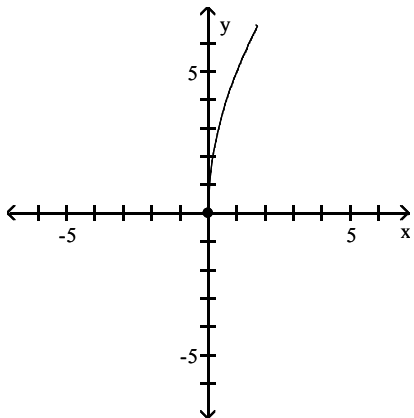
Answer Key

Testname: EXAM 2PREPARATION CH1 & CH 2V02

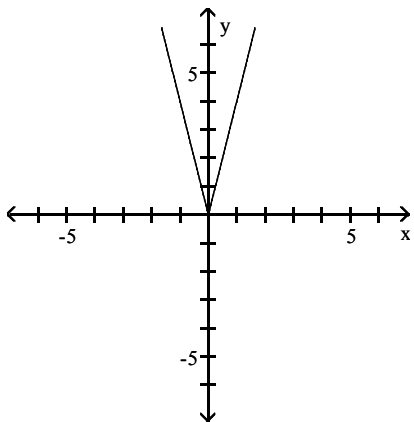
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36)



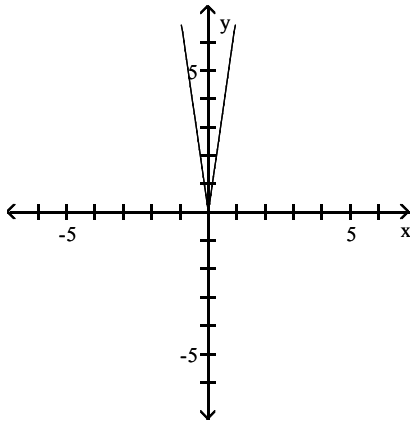
37)



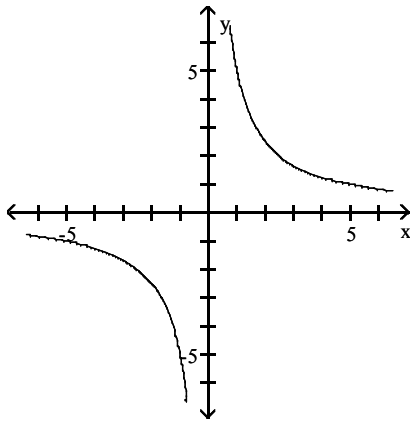
Answer Key

Testname: EXAM 2PREPARATION CH1 & CH 2V02

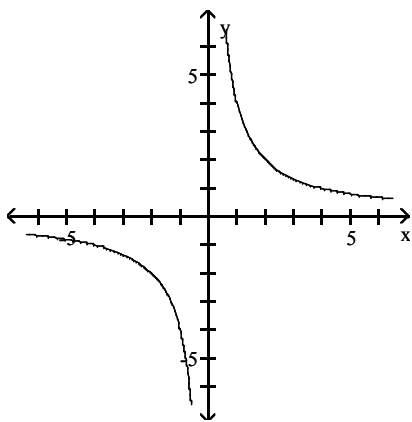
38)



39)



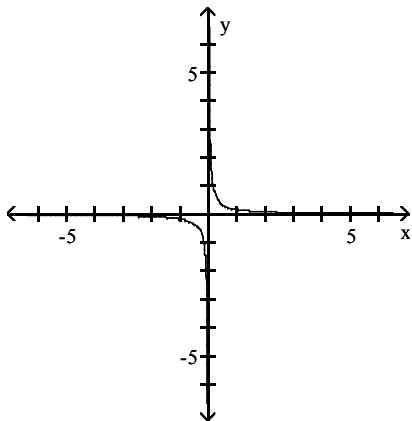
40)



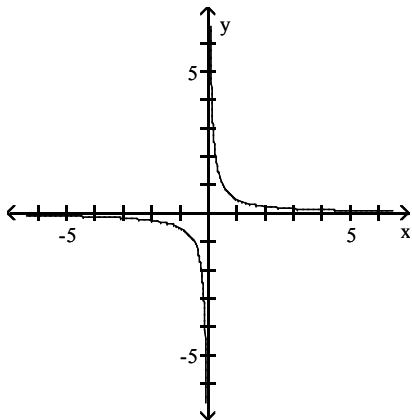
Answer Key

Testname: EXAM 2PREPARATION CH1 & CH 2V02

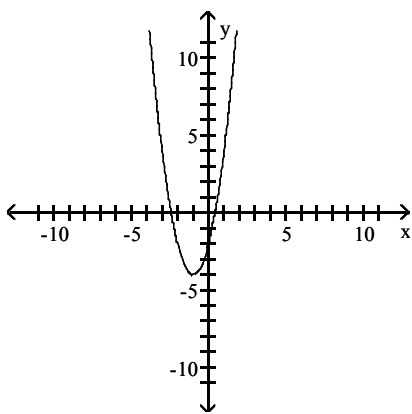
41)



42)



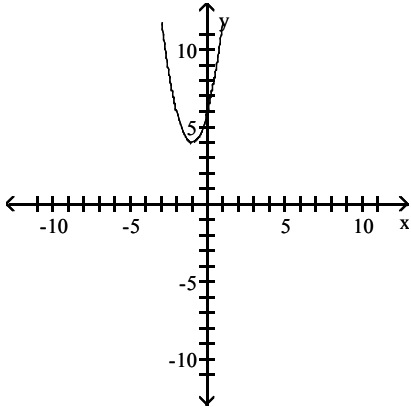
43)



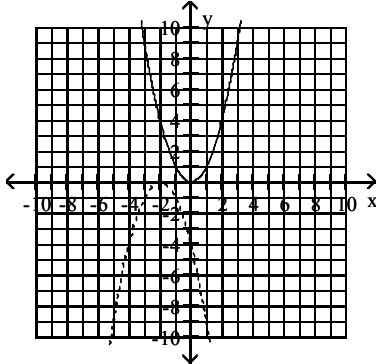
Answer Key

Testname: EXAM 2PREPARATION CH1 & CH 2V02

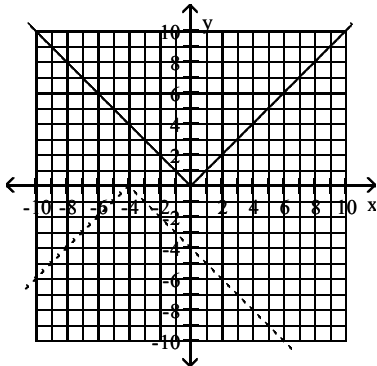
44)



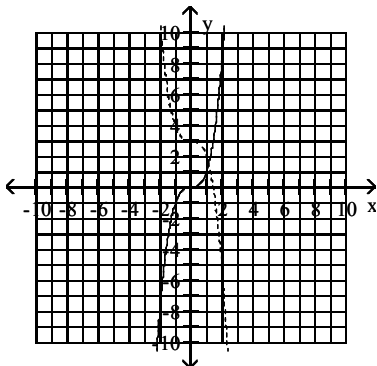
45)



46)



47)



48) Neither

49) Even

Answer Key

Testname: EXAM 2PREPARATION CH1 & CH 2V02

50) Odd

51) $-10x + 18$

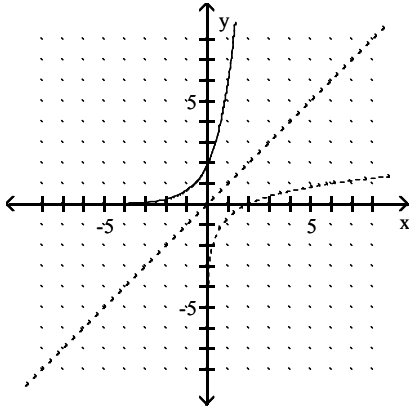
52) $-10x + 15$

53) x

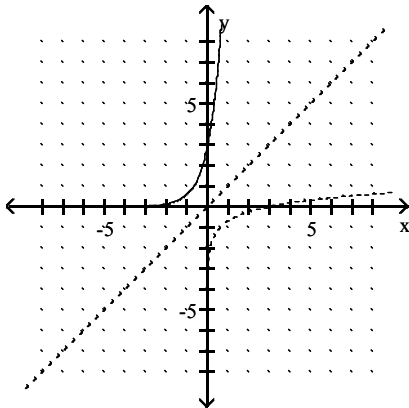
54) x

55) 3

56)



57)



58) $9x + 2$

59) $16x + 5$

60) $\frac{21x}{8 - 24x}$

61) $\frac{25x}{3 - 40x}$

62) x

63) x

64) $\{x \mid x \geq 5, x \neq 105\}$

65) $\{x \mid x \geq 2, x \neq 38\}$

66) $\{x \mid x \neq -3, x \neq -5\}$

67) $\{x \mid x \neq -5, x \neq -8\}$

68) $\left\{x \mid -\frac{1}{2} \leq x \leq \frac{3}{2}\right\}$

69) $(-\infty, -12)$ or $(-12, \infty)$

70) $(-\infty, -11)$ or $(-11, \infty)$

71) $(-\infty, -6)$ or $(-6, 0)$ or $(0, \infty)$

72) $(-\infty, -3)$ or $(-3, 0)$ or $(0, \infty)$

Answer Key

Testname: EXAM 2PREPARATION CH1 & CH 2V02

73) $[0, \infty)$

74) $[0, \infty)$

75) Yes

76) No

77) No

78) Yes

79) Yes

80) No

81) Yes

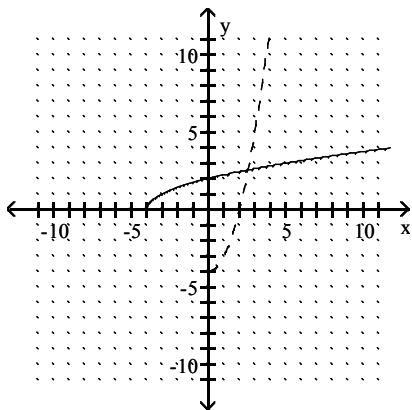
82) $\{(-8, 10), (-7, 8), (-6, 6), (-5, 4)\}$; $D = \{-8, -7, -6, -5\}$; $R = \{10, 8, 6, 4\}$

83) $\{(2, -9), (9, -2), (-4, -5), (4, 5)\}$; $D = \{2, 9, -4, 4\}$; $R = \{-9, -2, -5, 5\}$

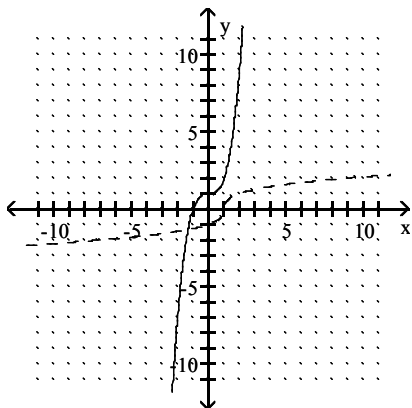
84) $\{(4, -3), (5, -1), (2, 0), (6, 2), (7, 5)\}$; $D = \{2, 4, 5, 6, 7\}$; $R = \{-3, -1, 0, 2, 5\}$

85) $\{(2, 6), (3, 9), (4, 7), (5, 5)\}$; a function

86)



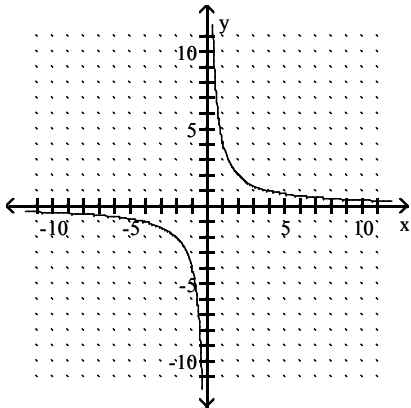
87)



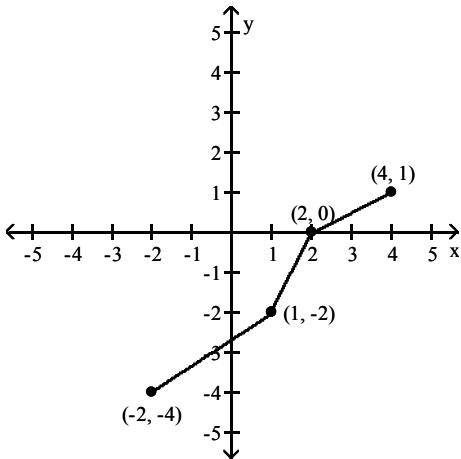
Answer Key

Testname: EXAM 2PREPARATION CH1 & CH 2V02

88) Function is its own inverse



89)



90) No

91) Yes

92) Yes

93) Yes; Exclude the interval $(-\infty, 9)$

94) Yes

95) No

96) No

97) Yes

98) No

99) Yes

100) $f(x)$: $D = \{x \mid x \neq -3\}$, $R = \{y \neq 0\}$;

$f^{-1}(x)$: $D = \{x \mid x \neq 0\}$, $R = \{y \mid y \neq -3\}$

101) $f(x)$: $D = \left\{x \mid x \geq \frac{3}{5}\right\}$, $R = \{y \mid y \geq 0\}$;

$f^{-1}(x)$: $D = \{x \mid x \geq 0\}$, $R = \left\{y \mid y \geq \frac{3}{5}\right\}$

102) $f(x)$: $D = \left\{x \mid x \geq -\frac{1}{2}\right\}$, $R = \{y \mid y \geq 0\}$;

$f^{-1}(x)$: $D = \{x \mid x \geq 0\}$, $R = \left\{y \mid y \geq -\frac{1}{2}\right\}$