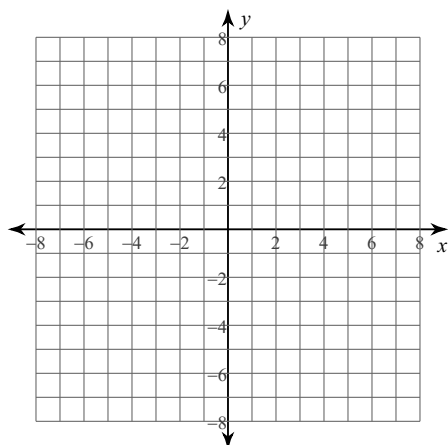


Chapter 3 Retest packet

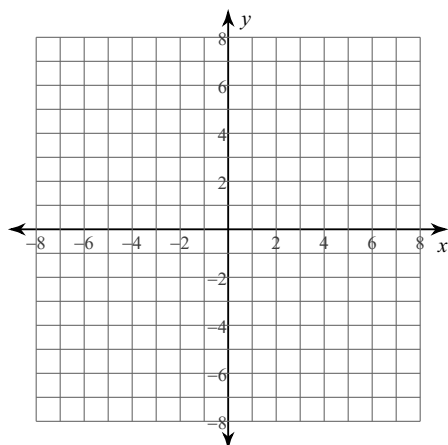
Date _____ Period _____

Identify the holes, vertical asymptotes, and horizontal asymptote of each. Then sketch the graph.
(No Calculator portion of the test)

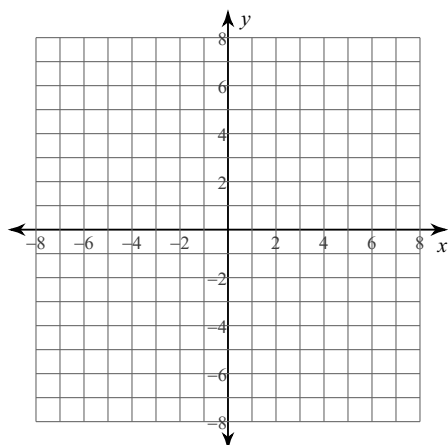
1) $f(x) = \frac{-x-3}{x+1}$



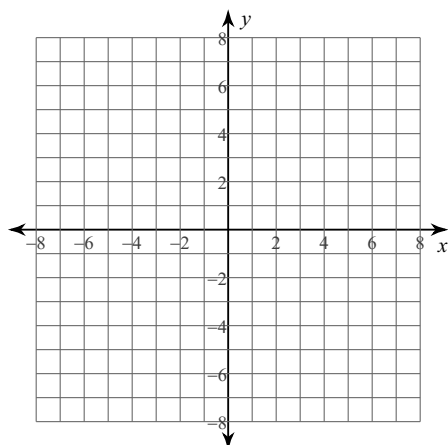
2) $f(x) = \frac{x+3}{x^2+3x}$



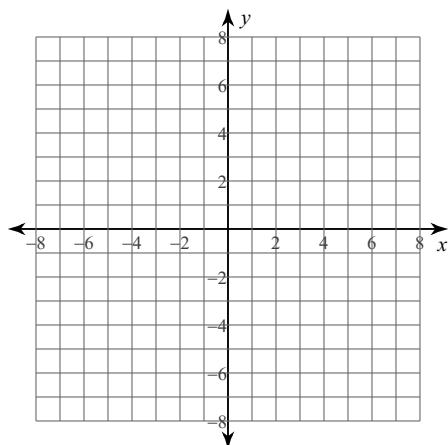
3) $f(x) = \frac{x^2+3x-4}{4x^2-12x+8}$



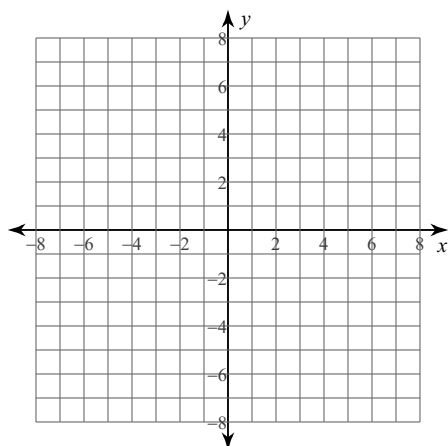
4) $f(x) = \frac{2x+8}{x+1}$



5) $f(x) = \frac{x^2+x-2}{4x+16}$



$$6) f(x) = \frac{x^2 - 5x + 4}{-4x^2 + 4x + 24}$$



Find the slant asymptote for each function. (No calculator portion)

$$7) f(x) = \frac{x^2 + 3x + 4}{x + 2}$$

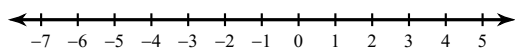
$$8) f(x) = \frac{6x^2 - 17x + 12}{3x - 4}$$

$$9) f(x) = \frac{x^3 + 1}{x^2}$$

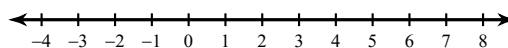
$$10) f(x) = \frac{3x^3 - 2x + x - 4}{x^2 + 1}$$

Solve each inequality and graph its solution. (No calculator portion)

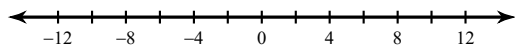
$$11) |3 - 5x| > 2$$



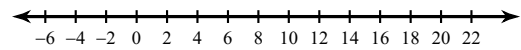
$$12) |6 + 9p| < 21$$



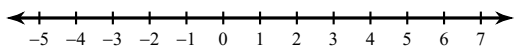
13) $|-3 - 8x| > 69$



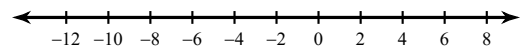
14) $|8 - a| \geq 11$



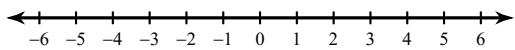
15) $|7x - 4| + 2 < 19$



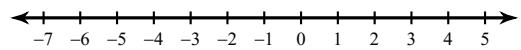
16) $|10 + 6n| - 2 \geq 36$



17) $|n + 1| - 1 < -12$

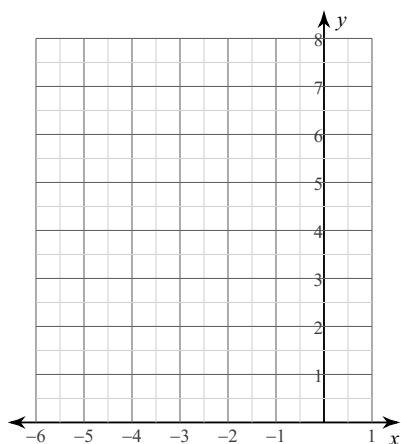


18) $5 + 3|-10m - 10| \leq 95$

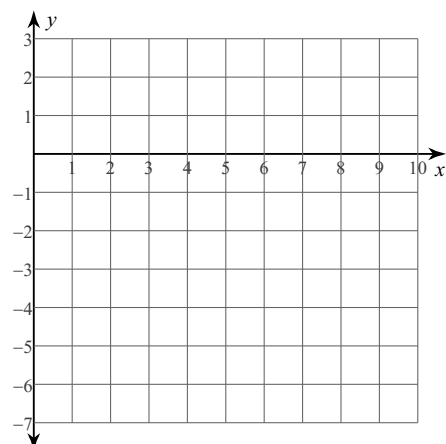


Sketch the graph of each function. (No calculator portion)

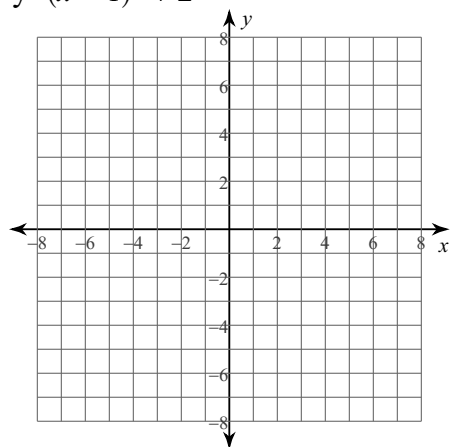
19) $y \leq (x + 4)^2 + 3$



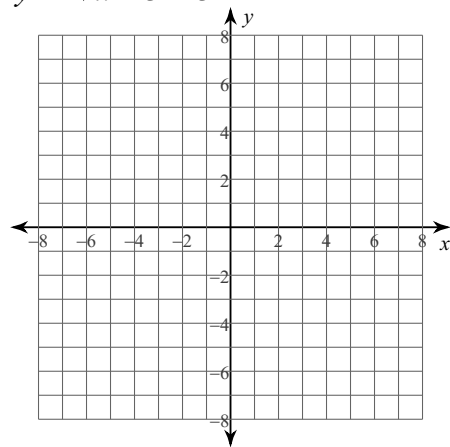
20) $y \leq -2(x - 2)^2 + 2$



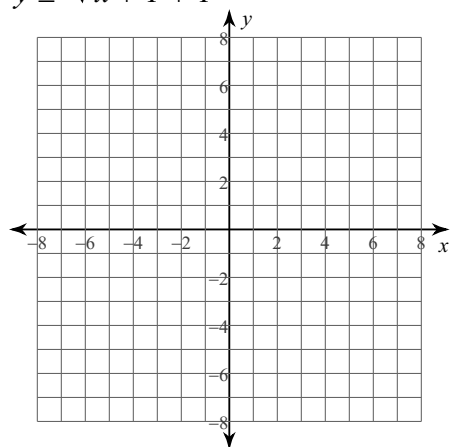
21) $y > (x - 1)^3 + 2$



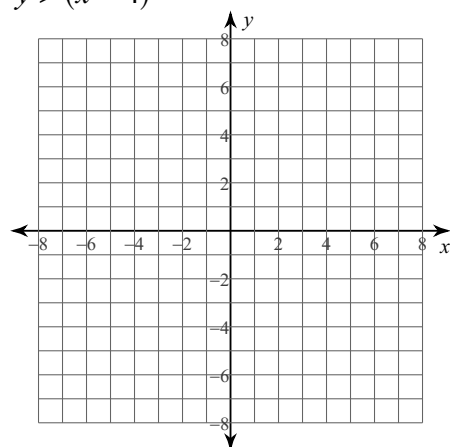
22) $y \leq \sqrt{x - 3} - 3$



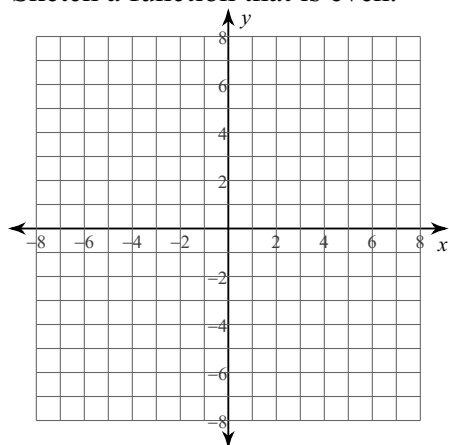
23) $y \geq \sqrt[3]{x + 1} + 1$



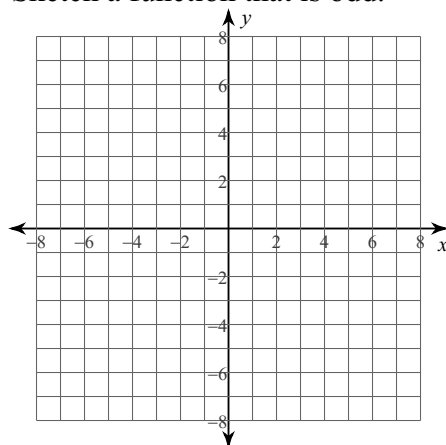
24) $y > (x - 4)^3$



25) Sketch a function that is even.



26) Sketch a function that is odd.



27) Describe the transformation of the parent graph.

$$y = 2\sqrt{x-4} + 3$$

28) Describe the transformation of the parent graph.

$$y = -\frac{1}{2}\sqrt{x+7} - 1$$

29) Describe the transformation of the parent graph.

$$y = \left(\frac{1}{2}x - 2\right)^2 + 7$$

30) Describe the transformation of the parent graph.

$$y = -|5x + 3| - 5$$

Determine whether each function is symmetric with respect to the x-axis, y-axis, $y=x$, $y=-x$ and/or the origin. Verify your work. (Calculators allowed)

31) $x + y^2 = 1$

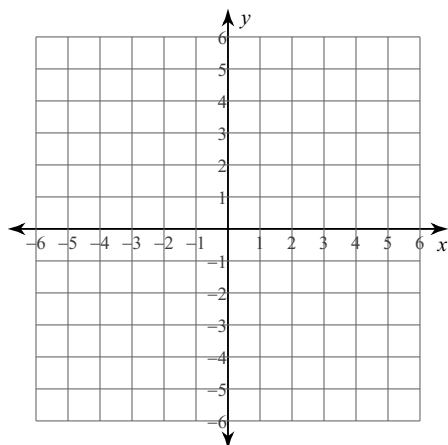
32) $y = -5x$

33) $y = x^3 - x$

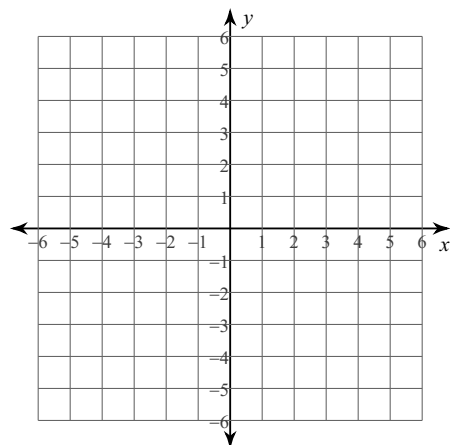
34) $4x^2 + 9y^2 = 108$

Find the inverse of each function. Then graph the function and its inverse.

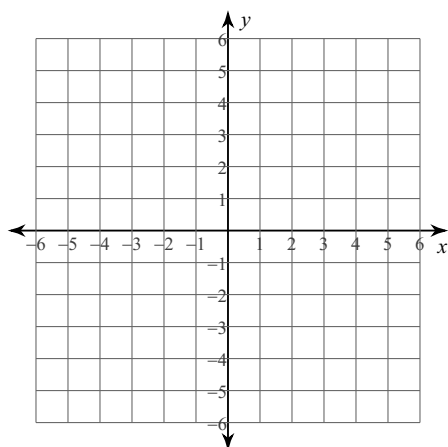
35) $g(n) = -1 + (n - 2)^3$



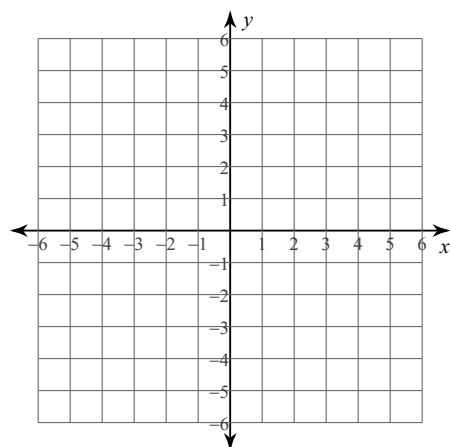
36) $g(x) = \frac{1}{x+1} + 1$



37) $g(x) = \sqrt[3]{x+2} - 2$

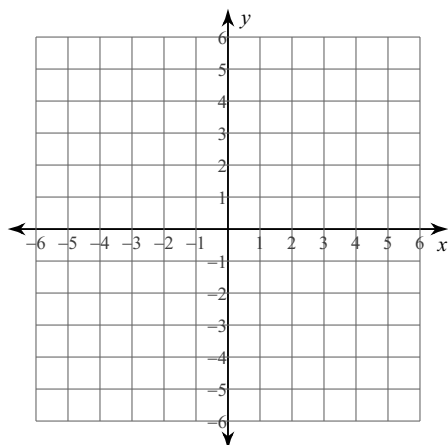


38) $h(n) = \sqrt[5]{n+2}$

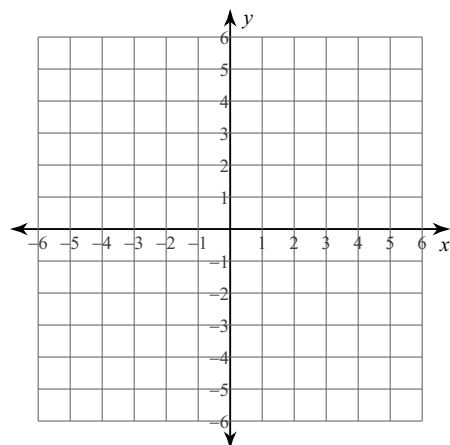


Graph each equation.

39) $y = -2|3x - 4| + 1$



40) $y = -2|-3x + 4| + 3$



Describe the end behavior of each function.

41) $f(x) = -x^2 - 6x - 5$

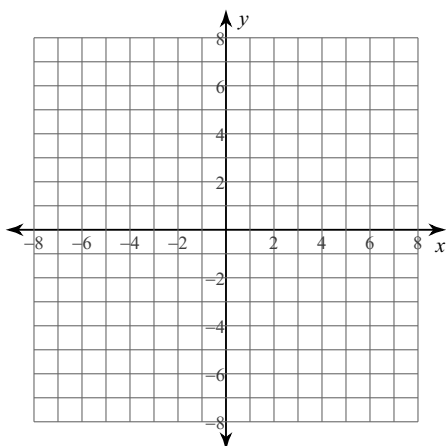
42) $f(x) = x^5 - 4x^3 + 4x - 4$

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

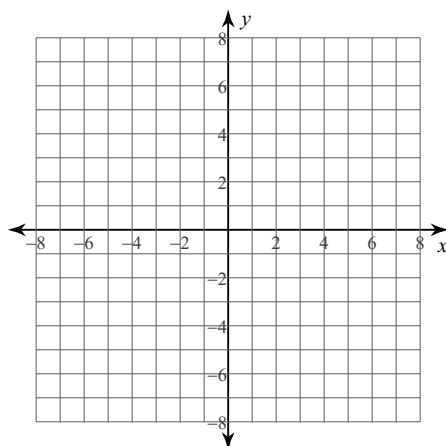
44) $f(x) = -x^4 + x^3 + 3x^2 - 5$

Sketch the graph of each function. Approximate the relative minima and relative maxima to the nearest tenth.

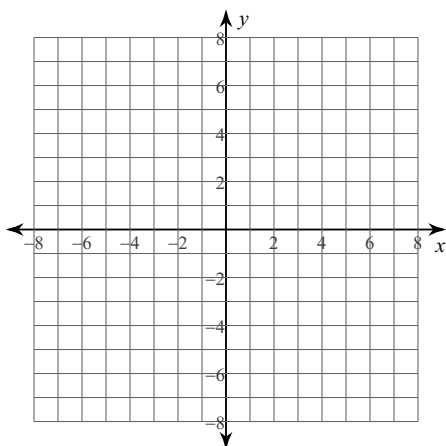
45) $f(x) = -x^4 + x^3 + 4x^2 - 4$



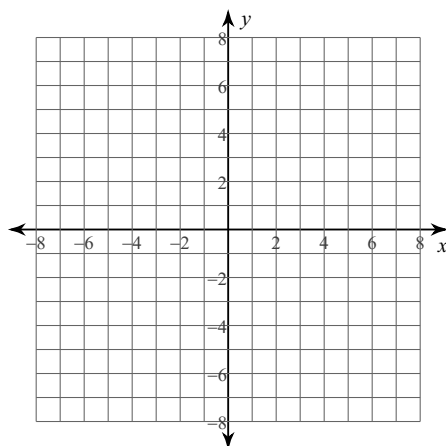
46) $f(x) = x^3 - x^2 - 2$



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



48) $f(x) = -x^5 + 3x^3 - 2$



Determine if the function is continuous at the given value. If discontinuous, state the type of discontinuity: point (hole), infinite (asymptote), jump.

49) $f(x) = x^2 + 2x - 1$ at $x = 4$.

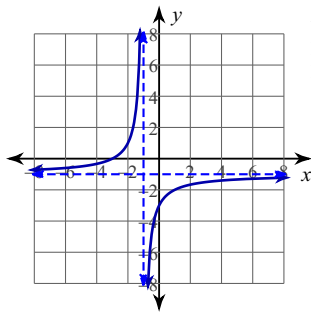
50) $f(x) = \frac{x^2 - x - 2}{x^2 - 3x - 4}$ at $x = 4$.

51) $f(x) = \frac{x^2 - x - 2}{x^2 - 3x - 4}$ at $x = -1$.

52) $f(x) = \frac{x^2 - x - 2}{x^2 - 3x - 4}$ at $x = 0$.

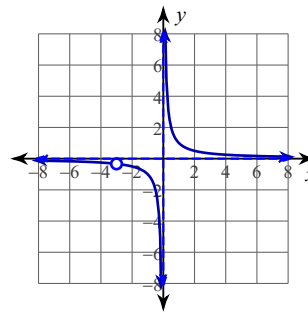
Answers to Chapter 3 Retest packet

1)



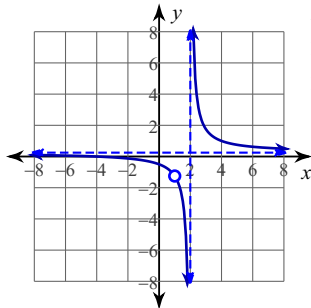
Vertical Asym.: $x = -1$
Holes: None
Horz. Asym.: $y = -1$

2)



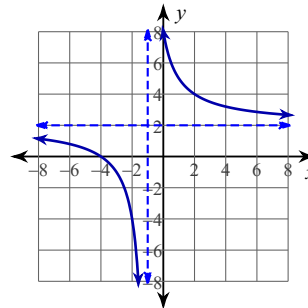
Vertical Asym.: $x = 0$
Holes: $x = -3$
Horz. Asym.: $y = 0$

3)



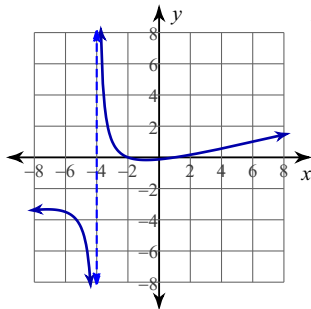
Vertical Asym.: $x = 2$
Holes: $x = 1$
Horz. Asym.: $y = \frac{1}{4}$

4)



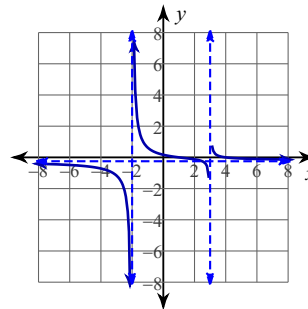
Vertical Asym.: $x = -1$
Holes: None
Horz. Asym.: $y = 2$

5)



Vertical Asym.: $x = -4$
Holes: None
Horz. Asym.: None

6)



Vertical Asym.: $x = 3, x = -2$
Holes: None
Horz. Asym.: $y = -\frac{1}{4}$

7) $y = x + 1$

8) $y = 2x - 3$

9) $y = x$

10) $y = 3x - 2$

11) $x < \frac{1}{5}$ or $x > 1$:

12) $-3 < p < \frac{5}{3}$:

13) $x < -9$ or $x > \frac{33}{4}$:

14) $a \leq -3$ or $a \geq 19$:

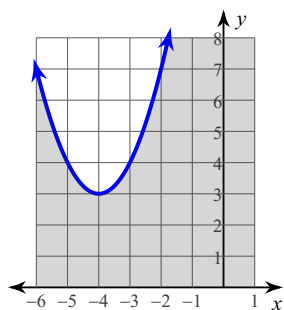
15) $-\frac{13}{7} < x < 3$:

16) $n \geq \frac{14}{3}$ or $n \leq -8$:

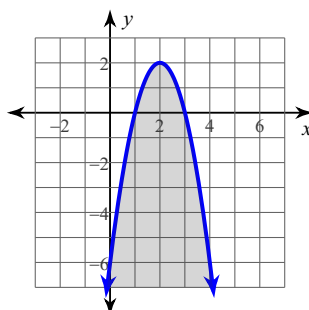
17) No solution. :

18) $-4 \leq m \leq 2$:

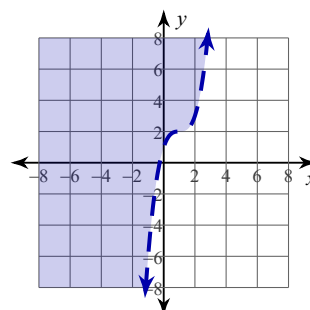
19)



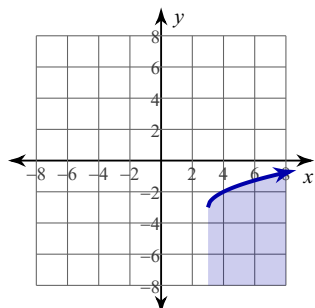
20)



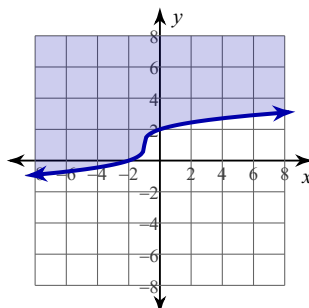
21)



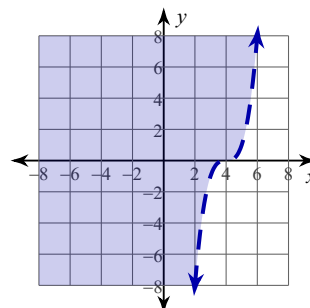
22)



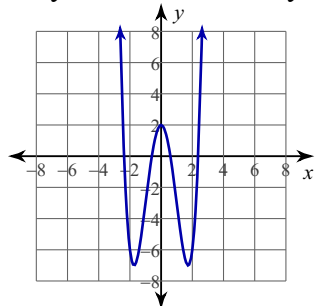
23)



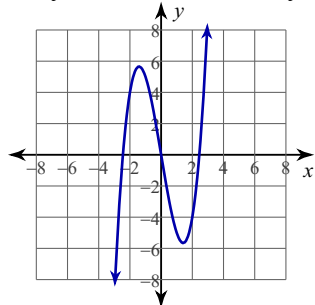
24)



25) Any function that is symmetrical to the y-axis is even.



26) Any function that is symmetrical to the origin is odd.



27) Right 4, Up 3, expands vertically

28) reflects over y-axis, Left 7, Down 1, compresses vertically

29) Right 2, Up 7, expands horizontally

30) reflects over y-axis, Left 3, Down 5, compresses horizontally

31) x-axis

32) origin

33) origin

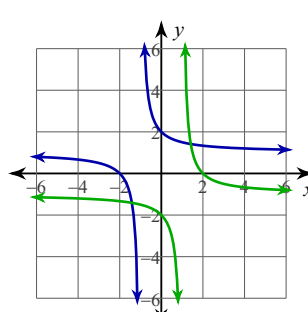
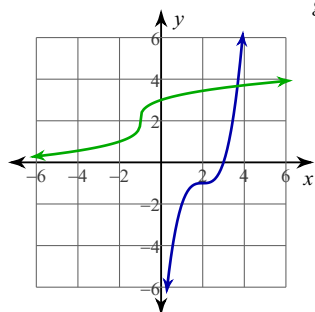
34) x-axis, y-axis

35)

36)

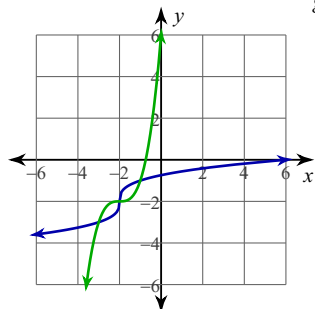
$$g^{-1}(n) = \sqrt[3]{n+1} + 2$$

$$g^{-1}(x) = \frac{1}{x-1} - 1$$



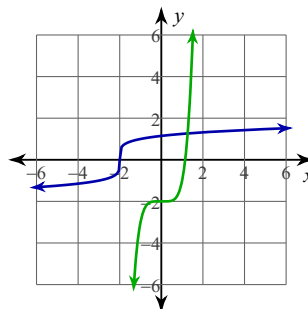
37)

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

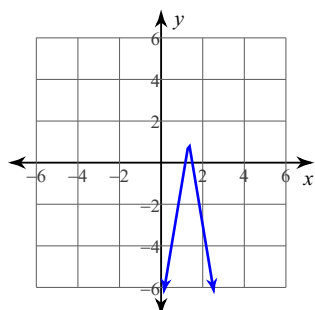


38)

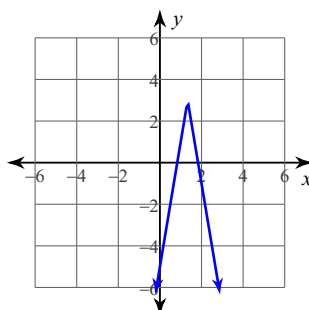
$$h^{-1}(n) = -2 + n^5$$



39)



40)



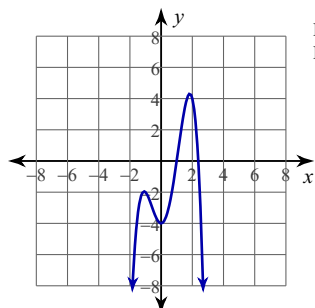
$$41) \begin{aligned} f(x) &\rightarrow -\infty \text{ as } x \rightarrow -\infty \\ f(x) &\rightarrow -\infty \text{ as } x \rightarrow +\infty \end{aligned}$$

$$42) \begin{aligned} f(x) &\rightarrow -\infty \text{ as } x \rightarrow -\infty \\ f(x) &\rightarrow +\infty \text{ as } x \rightarrow +\infty \end{aligned}$$

$$43) \begin{aligned} f(x) &\rightarrow -\infty \text{ as } x \rightarrow -\infty \\ f(x) &\rightarrow -\infty \text{ as } x \rightarrow +\infty \end{aligned}$$

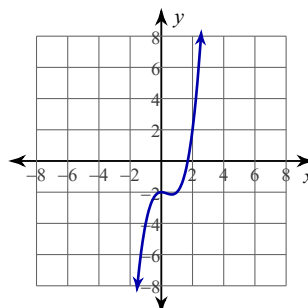
$$44) \begin{aligned} f(x) &\rightarrow -\infty \text{ as } x \rightarrow -\infty \\ f(x) &\rightarrow -\infty \text{ as } x \rightarrow +\infty \end{aligned}$$

45)



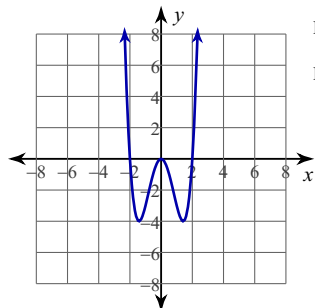
Minima: (0, -4)
Maxima: (-1.1, -2)
(1.8, 4.3)

46)



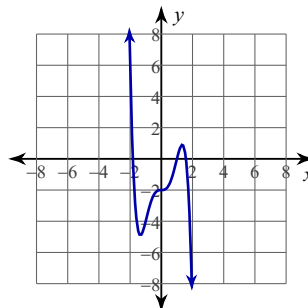
Minima: (0.7, -2.1)
Maxima: (0, -2)

47)



Minima: (-1.4, -4)
(1.4, -4)
Maxima: (0, 0)

48)



Minima: (-1.3, -4.9)
Maxima: (1.3, 0.9)

49) Continuous. $f(4)$ exists and the function is approaching 23 from the left and right of $x = 4$.

50) Infinite discontinuity. There is a vertical asymptote at $x = 4$.

51) Point discontinuity. There is a hole at $x = -1$.

52) Continuous. $f(0)$ exists and the function is approaching $1/2$ from the left and right of $x = 0$.