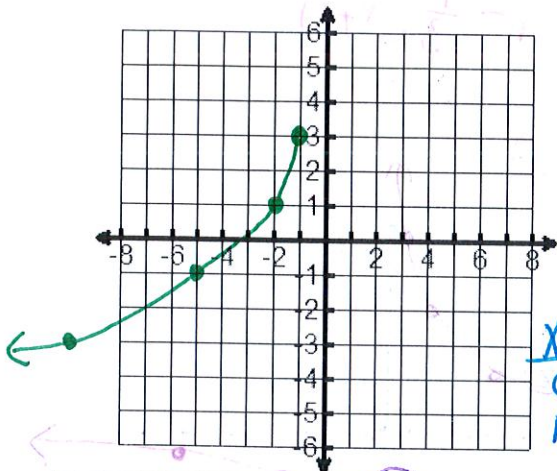


Name Key

Date _____

Graph each function, fill in the chart, and make a table of points.

1. $f(x) = -2\sqrt{-(x+1)} + 3$

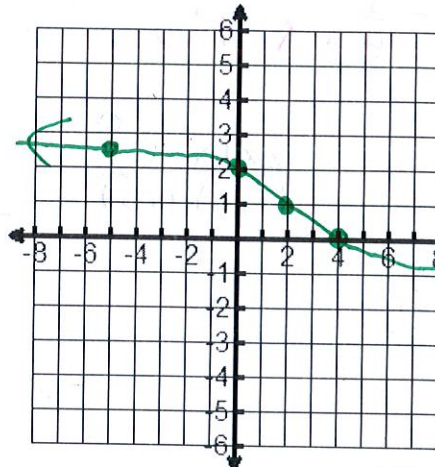


x	y
-1	3
-2	1
-5	-1
-10	-3

X-int
 $0 = -2\sqrt{-(x+1)} + 3$
 $1.5 = \sqrt{-(x+1)}$
 $x = -3.25$

Starting Pt: $(-1, 3)$	Inc or Dec: $(-\infty, -1)$
Domain: $(-\infty, -1]$	Range: $(-\infty, 3]$
Abs. Max or Abs Min: $(-1, 3)$	X-int: $(-3.25, 0)$
End Behavior: $x \rightarrow -\infty, f(x) \rightarrow -\infty$ $x \rightarrow -1, f(x) \rightarrow 3$	

2. $f(x) = \sqrt[3]{-1/2(x-2)} + 1$



x	y
-5	2.5
0	2
2	1
4	0
9	-0.5

Starting Pt: $(2, 1)$	Inc or Dec: $(-\infty, \infty)$
Domain: $(-\infty, \infty)$	Range: $(-\infty, \infty)$
Abs. Max or Abs Min: none	Y-int: $(0, 2)$
End Behavior: $x \rightarrow -\infty, f(x) \rightarrow \infty$ $x \rightarrow \infty, f(x) \rightarrow -\infty$	

Using the graph of $f(x) = \sqrt{x}$ as a guide, describe the transformation.

3. $g(x) = 4\sqrt{\frac{1}{3}|x+8|} - 1$ Vertical Stretch 4, reflect across y-axis, horizontal stretch 3 left 8, down 1

4. $g(x) = -\sqrt{3(x+17)} + 29$ Reflect over x-axis, horizontal shrink 1/3, left 17, up 29

Use the description to write the square root function **g**.

5. The parent function $f(x) = \sqrt{x}$ is reflected across the y-axis, vertically stretched by a factor of 7, and translated 3 units down.

$g(x) = 7\sqrt{-x} - 3$

6. The parent function $f(x) = \sqrt{x}$ is translated 2 units right, reflected across the x-axis, and compressed horizontally by a factor of $\frac{1}{2}$.

$g(x) = -\sqrt{2(x-2)}$

7. The parent function $f(x) = \sqrt{x}$ is compressed vertically by a factor of $1/4$, reflected across the x-axis, and translated 6 units up.

$$g(x) = -\frac{1}{4}\sqrt{x} + 6$$

8. The parent function $f(x) = \sqrt{x}$ is translated 8 units left, reflected across the y-axis, and stretched horizontally by a factor of 3.

$$g(x) = \sqrt{-\frac{1}{3}(x+8)}$$

9. $f(x) = \frac{2x^2 + 4x}{x^2 + 7x + 10}$

$$\frac{2x(x+2)}{(x+2)(x+5)}$$

$$y = \frac{2x}{x+5}$$

hole: $\frac{2(-2)}{-2+5} = \frac{-4}{3}$

Vertical Asymptote:

$$x = -5$$

Horizontal Asymptote:

$$y = 2$$

Slant Asymptote:

none

Holes:

$$(-2, -\frac{4}{3})$$

x-int:

$$(0, 0)$$

$$2x = 0$$

y-int:

$$(0, 0)$$

Domain:

$$(-\infty, -5) \cup (-5, -2) \cup (-2, \infty)$$

Range:

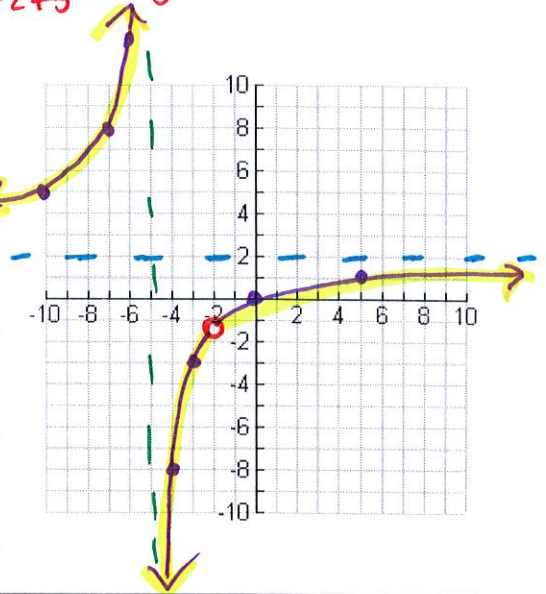
$$(-\infty, -\frac{4}{3}) \cup (-\frac{4}{3}, 2) \cup (2, \infty)$$

INC:

$$(-\infty, -5) \cup (-5, -2) \cup (-2, \infty)$$

DEC:

n/a



10. $f(x) = \frac{2x^2 + 5x - 3}{x + 2}$

$$\frac{(2x-1)(x+3)}{x+2}$$

$$\frac{-2}{2} \frac{2}{1} \frac{-5}{1} \frac{-3}{x}$$

Vertical Asymptote:

$$x = -2$$

Horizontal Asymptote:

none

Slant Asymptote:

$$y = 2x + 1$$

Holes:

none

x-int:

$$(-3, 0) \quad (\frac{1}{2}, 0)$$

$$2x-1=0 \quad x+3=0$$

y-int:

$$(0, -\frac{3}{2})$$

Domain:

$$(-\infty, -2) \cup (-2, \infty)$$

Range:

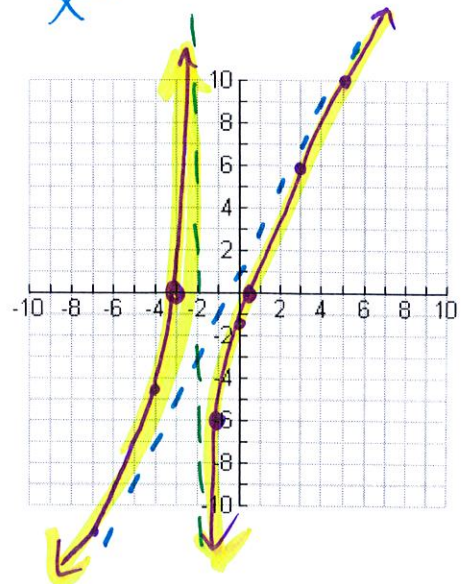
$$(-\infty, \infty)$$

INC:

$$(-\infty, -2) \cup (-2, \infty)$$

DEC:

n/a



11. Can rational functions have Horizontal Asymptotes and Slant Asymptotes?

Not one or the other

12. Can rational functions have Horizontal Asymptotes and Vertical Asymptotes?

yes!

13. $f(x) = \frac{x^2 - x - 20}{x^2 - 9} = \frac{(x-5)(x+4)}{(x+3)(x-3)}$

Vertical Asymptote:

$x = 3, -3$

Horizontal Asymptote:

$y = 1$

Slant Asymptote:

n/a

Holes:

n/a

x-int:

$(5, 0)(-4, 0)$

y-int: $(0, 20/9)$ or $(0, 2.22)$

Domain:

$(-\infty, -3)(-3, 3)(3, \infty)$

Range:

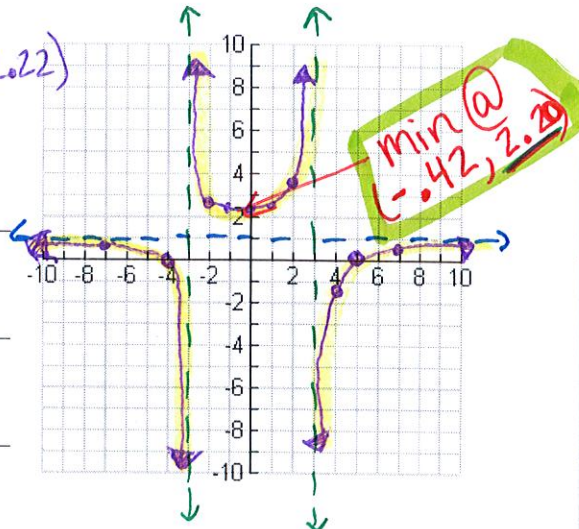
$(-\infty, 1) [2.20, \infty)$ ← y min!

INC:

$(-0.42, 3)(3, \infty)$

DEC:

$(-\infty, -3)(-3, -0.42)$



14. Find all the Asymptotes of $g(x) = \frac{x^2 - 2x + 5}{x + 2}$

$$\begin{array}{r} -2 \overline{) 1 \ -2 \ 5} \\ \underline{-1 \ 2 \ -8} \\ 1 \ -4 \end{array}$$

(doesn't factor)

VA: $x = -2$

HA: none

Slant: $y = x - 4$

15. What is the x-intercept and y-intercept for $h(x) = \frac{x-3}{(x+1)(x-2)}$

$$\frac{x-3}{x^2-x-2}$$

x-int: $(3, 0)$

y-int: $(0, 3/2)$

16. Write the equation of a rational function with vertical asymptotes of $x = 1$, $x = -2/3$ and a y-intercept of $(0, 3)$

constants reduce to 3. $f(x) = \frac{x^2 + x - 6}{(x-1)(3x+2)}$

Solve each inequality algebraically. Write in interval notation.

17. $\frac{6}{x+1} < -3$

Solve: $6 = -3(x+1)$
 $6 = -3x - 3$
 $-3 = x$

Denomin: $x+1=0$
 $x=-1$



$(-\infty, -1)$

18. $\frac{x+6}{x-2} \geq 0$

Solve: $x+6 = 0(x-2)$
 $x+6 = 0$
 $x = -6$

Denomin: $x-2=0$
 $x=2$



$[-6, 2)$

Test 0:
 $\frac{0+6}{0-2} \geq 0$
 $-3 \geq 0$
 no!