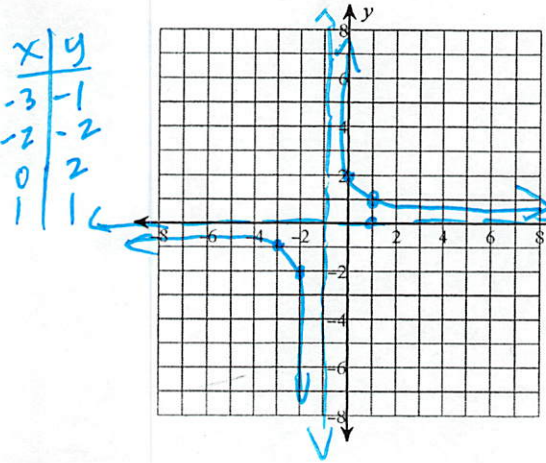


Section 7.3

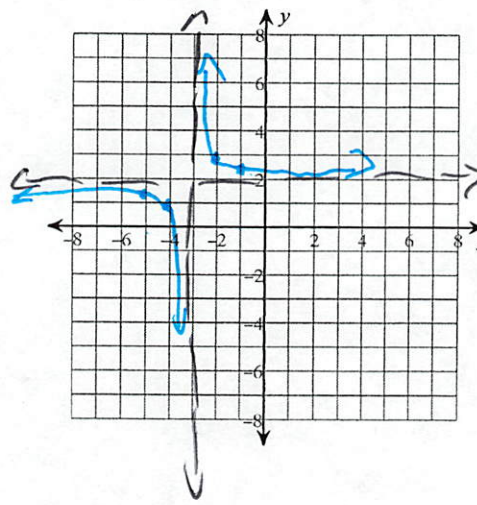
Identify the vertical asymptotes, and horizontal asymptote of each. Then sketch the graph.

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



Asymptotes  
 $x = -1$   
 $y = 0$   
 D:  $x \neq -1$   
 R:  $y \neq 0$

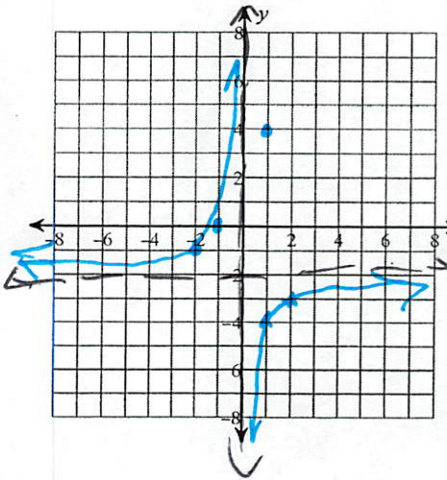
2)  $f(x) = \frac{1}{x+3} + 2$



Asymptotes  
 $x = -3$   
 $y = 2$   
 D:  $x \neq -3$   
 R:  $y \neq 2$

x	y
-5	3/2
-4	1
-2	3
-1	2 1/2

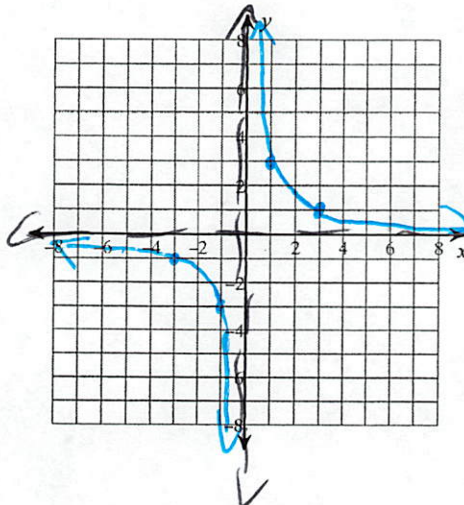
3)  $f(x) = -\frac{2}{x} - 2$



Asymptotes  
 $x = 0$   
 $y = -2$   
 D:  $x \neq 0$   
 R:  $y \neq -2$

x	y
-2	-1
-1	0
1	-4
2	-3

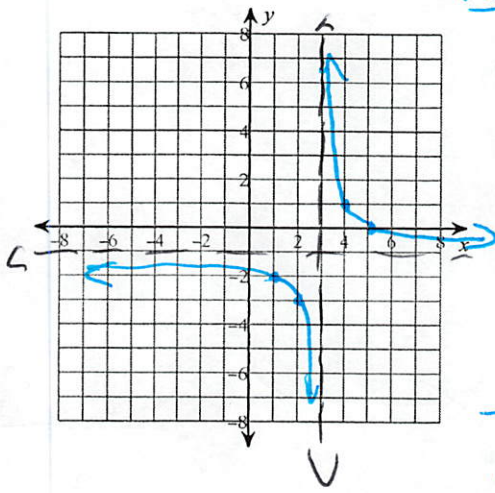
4)  $f(x) = \frac{3}{x}$



Asymptotes  
 $x = 0$   
 $y = 0$   
 D:  $x \neq 0$   
 R:  $y \neq 0$

x	y
-3	-1
-1	-3
1	3
3	1

$$5) f(x) = \frac{2}{x-3} - 1$$



Asymptotes

$$x=3$$

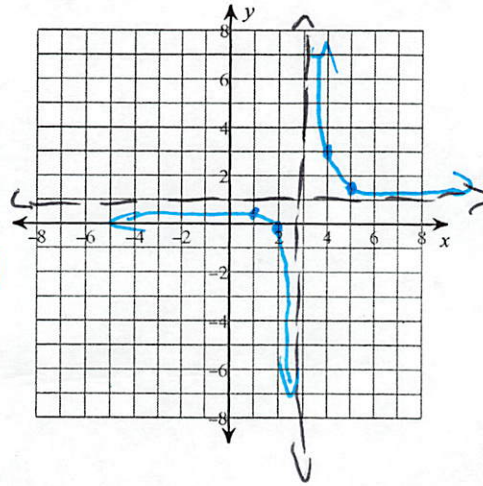
$$y=-1$$

$$D: x \neq 3$$

$$R: y \neq -1$$

x	y
1	-2
2	-3
4	1
5	0

$$6) f(x) = \frac{1}{x-3} + 1$$



Asymptotes

$$x=3$$

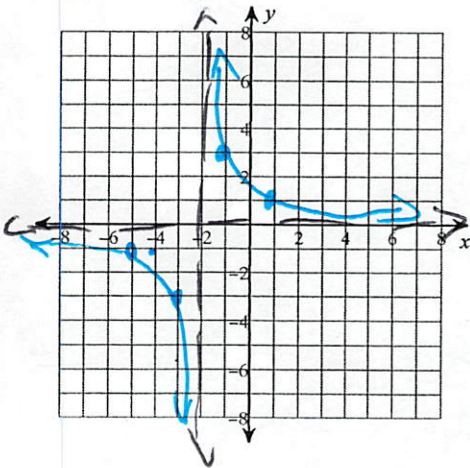
$$y=1$$

$$D: x \neq 3$$

$$R: y \neq 1$$

x	y
5	1 1/2
4	2
2	0
1	1/2

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



Asymptotes

$$x=-2$$

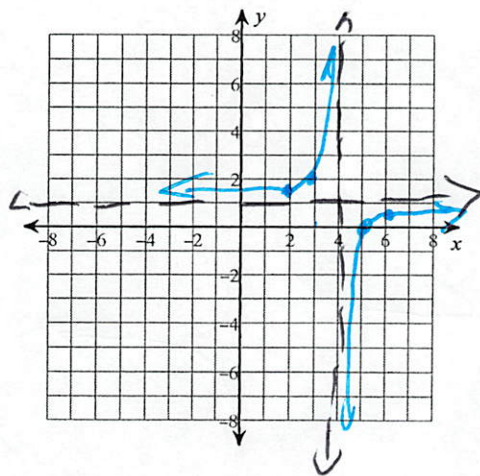
$$y=0$$

$$D: x \neq -2$$

$$R: y \neq 0$$

x	y
-5	-1
-3	-3
-1	3
1	1

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



Asymptotes

$$x=4$$

$$y=1$$

$$D: x \neq 4$$

$$R: y \neq 1$$

x	y
2	1 1/2
3	2
5	0
6	1/2

## Review Sections 7.1-7.3

Simplify each expression.

1)  $\frac{v+3}{v-2} \div \frac{5v+35}{v-2}$

$$\frac{(v+3)}{(v-2)} \cdot \frac{(v-2)}{5(v+7)} = \boxed{\frac{(v+3)}{5(v+7)}}$$

2)  $\frac{k^2 - 5k + 4}{k-2} \cdot \frac{1}{k-4}$

$$\frac{(\cancel{k-4})(k-1)}{(k-2)} \cdot \frac{1}{(\cancel{k-4})} = \boxed{\frac{(k-1)}{(k-2)}}$$

3)  $\frac{r^2 + 2r - 3}{r+8} \cdot \frac{r+8}{r^2 - 2r + 1}$

$$\frac{(r+3)(\cancel{r-1})}{(\cancel{r+8})} \cdot \frac{(r+8)}{(r-1)(r-1)} = \boxed{\frac{(r+3)}{(r-1)}}$$

4)  $\frac{n-8}{n-4} \div \frac{n-5}{n^2 - 9n + 20}$

$$\frac{(n-8)}{(n-4)} \cdot \frac{(n-5)(\cancel{n-4})}{(n-5)} = \boxed{(n-8)}$$

$$5) \frac{\frac{3}{4}}{\frac{16}{x} - \frac{3}{x}} = \frac{\frac{3}{4}}{\frac{13}{x}} = \frac{3}{4} \cdot \frac{x}{13} = \boxed{\frac{3x}{52}}$$

$$6) \frac{\frac{1}{x} + \frac{x}{8}}{\frac{1}{4}} \cdot \frac{8x}{8x} = \boxed{\frac{8+x^2}{2x}}$$

7)  $\frac{7x+4y}{8y^3} - \frac{x-4y}{8y^3}$

$$\frac{7x+4y - (x-4y)}{8y^3}$$

$$= \frac{6x+8y}{8y^3} = \frac{2(3x+4y)}{8y^3} = \boxed{\frac{(3x+4y)}{4y^3}}$$

$$8) \frac{3}{2} + \frac{2y}{2xy} = \frac{3}{2} + \frac{1}{x} = \frac{3x}{2x} + \frac{2}{2x} = \boxed{\frac{(3x+2)}{2x}}$$

9)  $\frac{2}{2x+12} - \frac{5x}{x+6} \cdot \frac{2}{2}$

$$\frac{2}{2(x+6)} - \frac{10x}{2(x+6)} = \frac{2-10x}{2(x+6)} = \frac{2(1-5x)}{2(x+6)} = \boxed{\frac{(1-5x)}{(x+6)}}$$

10)  $\frac{2}{n+2} + \frac{3}{n-2}$

$$= \frac{2(n-2)}{(n+2)(n-2)} + \frac{3(n+2)}{(n+2)(n-2)}$$

$$\frac{2n-4+3n+6}{(n+2)(n-2)} = \boxed{\frac{(5n+2)}{(n+2)(n-2)}}$$

$$11) \frac{6}{v^2 + 4v - 12} + \frac{5}{v + 6}$$

$$(v+6)(v-2)$$

$$\frac{6}{(v+6)(v-2)} + \frac{5(v-2)}{(v+6)(v-2)} = \frac{6 + 5v - 10}{(v+6)(v-2)} = \frac{5v - 4}{(v+6)(v-2)}$$

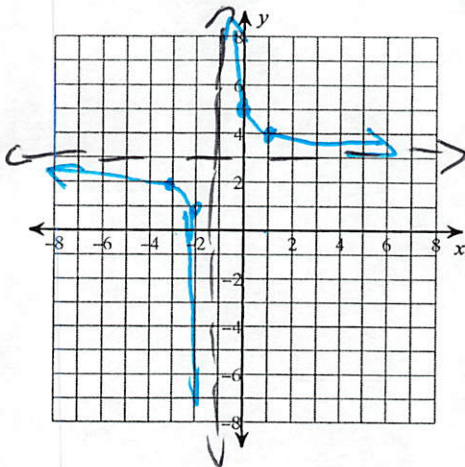
$$12) \frac{2}{n^2 - 9} - \frac{3}{n^2 - 7n + 12}$$

$$(n+3)(n-3) \quad (n-4)(n-3)$$

$$\frac{2(n-4)}{(n+3)(n-3)(n-4)} - \frac{3(n+3)}{(n+3)(n-3)(n-4)} = \frac{2n-8-3n-9}{(n+3)(n-3)(n-4)} = \frac{-n-17}{(n+3)(n-3)(n-4)}$$

Identify the vertical asymptotes, horizontal asymptote, domain, and range of each. Then sketch the graph.

$$13) f(x) = \frac{2}{x+1} + 3$$



Asymptotes

$$x = -1$$

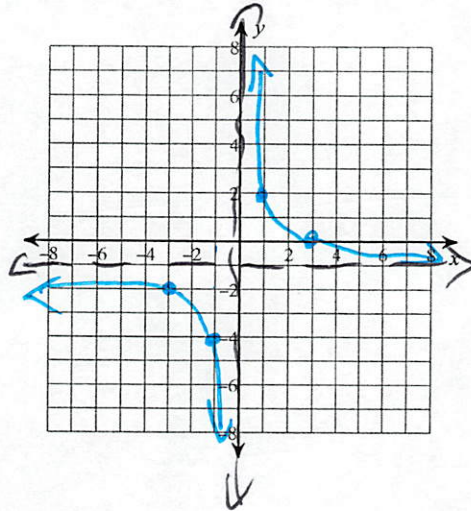
$$y = 3$$

$$D: x \neq -1$$

$$R: y \neq 3$$

x	y
-3	2
-2	1
0	5
1	4

$$14) f(x) = \frac{3}{x} - 1$$



Asymptotes

$$x = 0$$

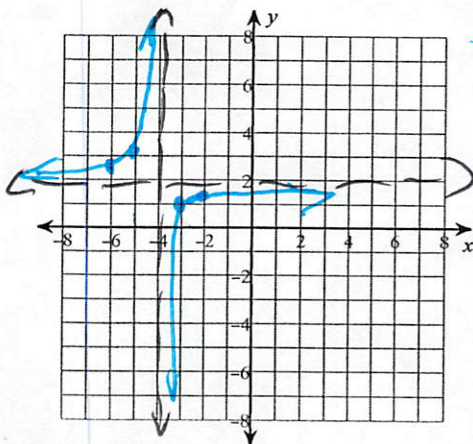
$$y = -1$$

$$D: x \neq 0$$

$$R: y \neq -1$$

x	y
-3	-2
-1	-4
1	2
3	0

$$15) f(x) = -\frac{1}{x+4} + 2$$



Asymptotes

$$x = -4$$

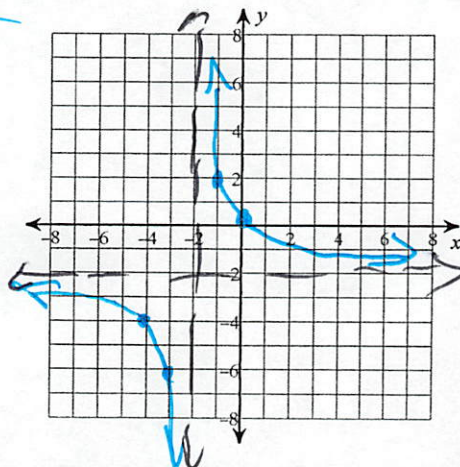
$$y = 2$$

$$D: x \neq -4$$

$$R: y \neq 2$$

x	y
-6	2 1/2
-5	3
-3	1 1/2
-2	1 1/2

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



Asymptotes

$$x = -2$$

$$y = -2$$

$$D: x \neq -2$$

$$R: y \neq -2$$

x	y
-4	-4
-3	-6
-1	2
0	0