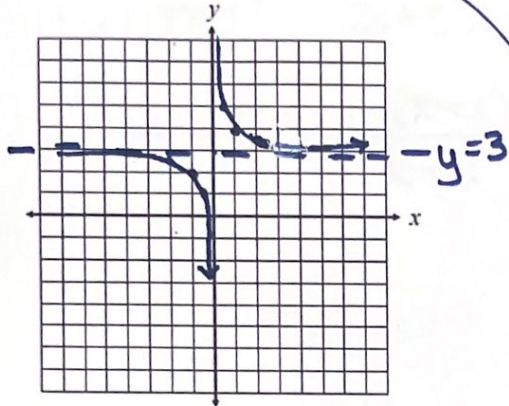


7.3 Graphing Reciprocal Functions Practice

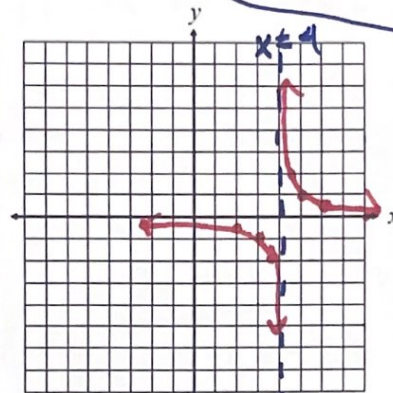
Directions: Graph and find the domain, range, and asymptotes.

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



Domain $(-\infty, 0) \cup (0, \infty)$
 Range $(-\infty, 3) \cup (3, \infty)$
 Horizontal asymptote $y = 3$
 Vertical asymptote $x = 0$

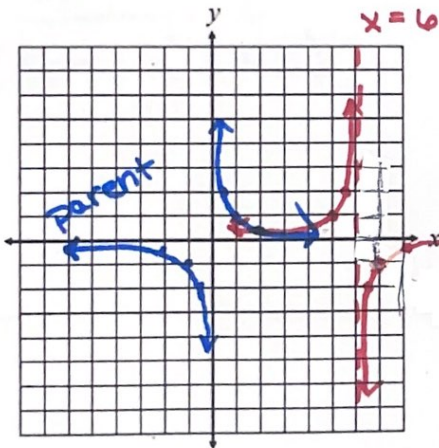
2. $f(x) = \frac{1}{x-4}$



shifts 4 units right

Domain $(-\infty, 4) \cup (4, \infty)$
 Range $(-\infty, 0) \cup (0, \infty)$
 Horizontal asymptote $y = 0$
 Vertical asymptote $x = 4$

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

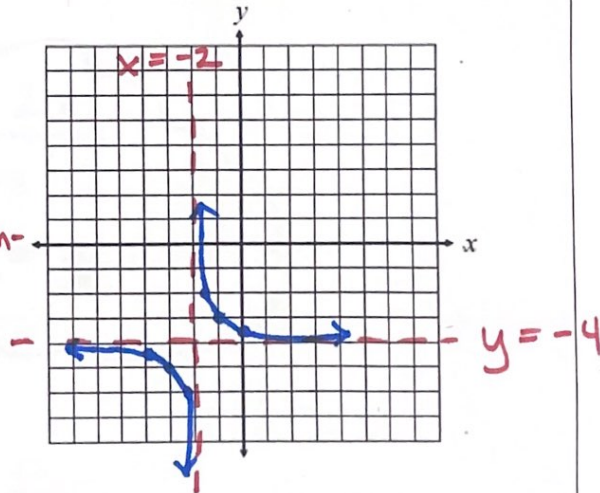


transformation

Domain $(-\infty, 6) \cup (6, \infty)$
 Range $(-\infty, 0) \cup (0, \infty)$
 Horizontal asymptote $y = 0$
 Vertical asymptote $x = 6$

shifts 6 units right

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



Domain $(-\infty, -2) \cup (-2, \infty)$
 Range $(-\infty, -4) \cup (-4, \infty)$
 Horizontal asymptote $y = -4$
 Vertical asymptote $x = -2$

shifts 4 units down
 shifts 2 units left

Directions: Simplify.

5. $\frac{2x^2-x-15}{x^2-2x-3} \div \frac{2x^2+3x-5}{1-x^2}$

$$\frac{\cancel{(2x+5)}\cancel{(x-3)}}{\cancel{(x-3)}\cancel{(x+1)}} \cdot \frac{\cancel{(1-x)}\cancel{(1+x)}}{\cancel{(2x+5)}\cancel{(x-1)}}$$

$$\frac{1-x}{x-1} \rightarrow \frac{-1\cancel{(x-1)}}{\cancel{x-1}}$$

-1

-1

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

$\frac{(2x+5)(x-1)}{(1-x)(1+x)}$

6. $\frac{x^2-5}{x^2+5x-14} - \frac{x+3}{x+7}$

$$\frac{x^2-5}{(x+7)(x-2)} - \frac{(x+3)(x-2)}{(x+7)(x-2)}$$

$$\frac{x^2-5}{(x+7)(x-2)} - \frac{[x^2+x-6]}{(x+7)(x-2)}$$

$$\frac{-x+1}{(x+7)(x-2)}$$

$x \neq -7, 2$

7. $\frac{2x^2+6x}{4x^2+11x-3}$

$$\frac{2x\cancel{(x+3)}}{(4x-1)\cancel{(x+3)}}$$

$$\frac{2x}{4x-1}$$

$x = \frac{1}{4}, -3$