Name _____ Date _____ Class _____

LESSON 8-2

Graphing More Complicated Rational Functions

Practice and Problem Solving: A/B

Identify all vertical asymptotes and holes of each rational function. Then state its domain.

1. $f(x) = \dfrac{x-1}{-3x^2+27}$

Vertical Asymptotes: _____

Holes: _____

Domain: _____

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

Vertical Asymptotes: _____

Holes: _____

Domain: _____

Determine the end behavior of each rational function.

3. $f(x) = \dfrac{x^2-4}{-3x}$

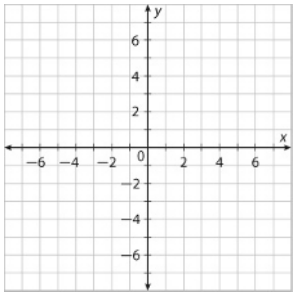
_____

4. $f(x) = \dfrac{x^2+5x+6}{x^2+7x+12}$

_____

Identify the asymptotes, holes, and *x*-intercepts of each rational function. Then graph the function.

5. $f(x) = \dfrac{x+2}{-2x^2-6x}$



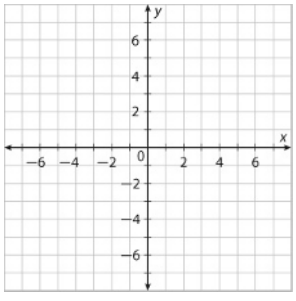
Vertical Asymptotes: _____

Horizontal Asymptotes: _____

Holes: _____

x-intercept(s): _____

6. $f(x) = \dfrac{-x^2+1}{x^2-3x+2}$



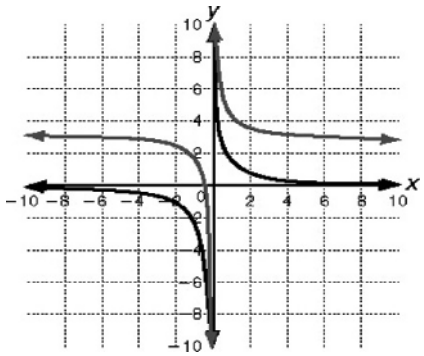
Vertical Asymptotes: _____

Horizontal Asymptotes: _____

Holes: _____

x-intercept(s): _____

2. Translated 3 units up



3. a. Translated 7 units down and 3 units left

   b. $x = -3$

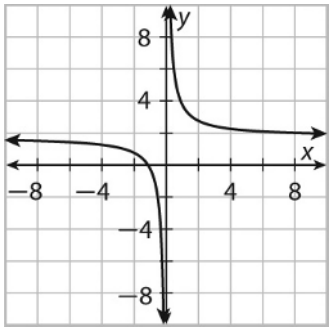
   c. $y = -7$

   d. $\{x \mid x \neq -3\}$

   e. $\{y \mid y \neq -7\}$

4. a. Vertical asymptote: $x = 0$; horizontal asymptote: $y = 2$

   b.



Reading Strategies

1. $x = 6$; $y = -5$; $\{x \mid x \neq 6\}$; $\{y \mid y \neq -5\}$
2. $x = -4$; $y = 1$; $\{x \mid x \neq -4\}$; $\{y \mid y \neq 1\}$
3. $x = 2$
4. $y = -3$
5. $\{x \mid x \neq 2\}$
6. $\{y \mid y \neq -3\}$
7. $f(x) = \dfrac{1}{x-2} - 3$

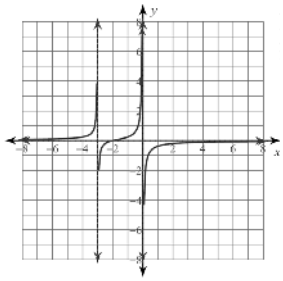
Success for English Learners

1. I know a rational function is translated to the left by the value of h in $f(x) = \dfrac{1}{x-h}$.
2. I know the vertical asymptote is the line $x = h$ in the form $f(x) = \dfrac{a}{x-h} + k$.
3. I know the horizontal asymptote is the line $y = k$ in the form $f(x) = \dfrac{a}{x-h} + k$.

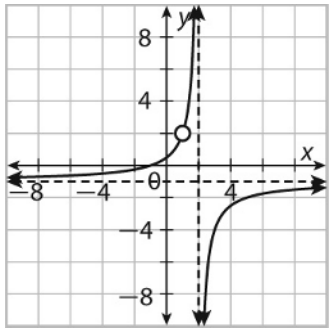
LESSON 8-2

Practice and Problem Solving: A/B

1. Vertical asym.: $x = -3$, $x = 3$; Holes: none; Domain: $\{x \mid x \neq -3,\ 3\}$
2. Vertical asym.: $x = 2$; Holes: $x = -4$; Domain: $\{x \mid x \neq -4,\ 2\}$
3. As $x \to +\infty$, $f(x) \to -\infty$; As $x \to -\infty$, $f(x) \to +\infty$
4. As $x \to +\infty$, $f(x) \to 1$; As $x \to -\infty$, $f(x) \to 1$
5. Vertical asym.: $x = -3$, $x = 0$; Horizontal asym.: $y = 0$; Holes: none; x-intercepts: -2;



6. Vertical asym.: $x = 2$; Horizontal asym.: $y = -1$; Holes: $x = 1$; x-intercepts: -1;



Practice and Problem Solving: C

1. Vertical asym.: $x = -2$, $x = 3$; Holes: none; Domain: $\{x \mid x \neq -2,\ 3\}$
2. Vertical asym.: $x = -1$; Holes: $x = -3$; Domain: $\{x \mid x \neq -3,\ -1\}$