

LESSON
8-2

Graphing More Complicated Rational Functions

Reading Strategies: Analyze Information

Use a graphic aid to find the vertical asymptotes and any holes

of $f(x) = \frac{x^2 + 5x + 6}{2x^2 - 5x - 3}$.

$$f(x) = \frac{x^2 + 5x + 6}{2x^2 - 5x - 3} = \frac{(x + 3)(x + 2)}{(2x - 1)(x + 3)}$$

Factor the numerator and denominator.

$$(x + 3)(x + 2) = 0$$

$$x = -3 \text{ and } x = -2$$

Find the zeros of the numerator.

$$(2x - 1)(x + 3) = 0$$

$$x = \frac{1}{2} \text{ and } x = -3$$

Find the zeros of the denominator.

$x = -3$ makes the numerator 0.

$x = -3$ is a hole.

$x = \frac{1}{2}$ does not make the numerator 0.

Compare the zeros of the denominator with the zeros of the numerator.

$x = \frac{1}{2}$ is a vertical asymptote.

Find the vertical asymptotes and any holes of the given rational functions.

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

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

Complete the table for the given functions.

	Function	Vertical Asymptotes	Holes	Domain	Range
3.	$f(x) = \frac{x - 3}{x + 4}$				
4.	$f(x) = \frac{x^2 + x - 12}{x^2 - 16}$				
5.	$f(x) = \frac{x + 4}{x^2 + 2x - 8}$				