8 CHAPTER REVIEW

8.2 Graph Simple Rational Functions

pp. 558–563

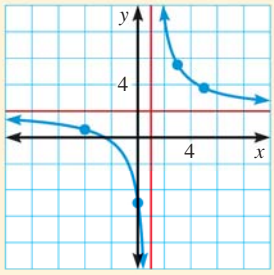
EXAMPLE

Graph $y = \frac{2x + 5}{x - 1}$. State the domain and range.

STEP 1 **Draw** the asymptotes. Solve $x - 1 = 0$ for x to find the vertical asymptote $x = 1$. The horizontal asymptote is the line $y = \frac{2}{1} = 2$.

STEP 2 **Plot** points to the left and to the right of the vertical asymptote.

STEP 3 **Draw** the two branches of the hyperbola so that they pass through the plotted points and approach the asymptotes.



▸ The domain is all real numbers except 1. The range is all real numbers except 2.

EXERCISES

Graph the function. State the domain and range.

EXAMPLES 2 and 3 on pp. 559–560 for Exs. 10–12

10. $y = \frac{4}{x - 3}$ **11.** $y = \frac{1}{x + 5} + 2$ **12.** $f(x) = \frac{3x - 2}{x - 4}$

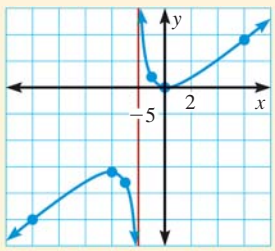
8.3 Graph General Rational Functions

pp. 565–571

EXAMPLE

Graph $y = \frac{2x^2}{x + 2}$.

- The numerator has 0 as its only zero, so the graph has an x-intercept at $(0, 0)$.
- The denominator has -2 as its only zero, so the graph has a vertical asymptote at $x = -2$.
- The degree of the numerator (2) is greater than the degree of the denominator (1). So, there is no horizontal asymptote. The graph has the same end behavior as the graph of $y = \frac{2}{1}x^{2-1} = 2x$.



EXERCISES

Graph the function.

EXAMPLES 1, 2, and 3 on pp. 565–566 for Exs. 13–18

13. $y = \frac{5}{x^2 + 1}$ **14.** $y = \frac{4x^2}{x - 1}$ **15.** $h(x) = \frac{6x^2}{x - 2}$

16. $y = \frac{-8}{x^2 + 3}$ **17.** $y = \frac{x^2 + 6}{x^2 - 3x - 40}$ **18.** $g(x) = \frac{x^2 - 1}{x + 4}$