

# 12 CHAPTER REVIEW

## 12.2 Graph Rational Functions

pp. 775–782

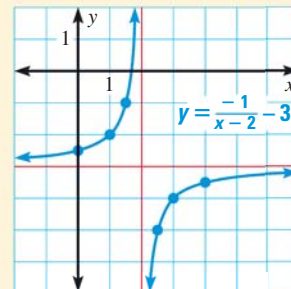
### EXAMPLE

Graph  $y = \frac{-1}{x-2} - 3$ .

**STEP 1** Identify the asymptotes of the graph. The vertical asymptote is  $x = 2$ , and the horizontal asymptote is  $y = -3$ .

**STEP 2** Plot several points on each side of the vertical asymptote.

**STEP 3** Graph two branches that pass through the plotted points and approach the asymptotes.



### EXERCISES

Graph the function.

8.  $y = \frac{4}{x} + 1$

9.  $y = \frac{1}{x-6}$

10.  $y = \frac{2}{x+1} + 1$

### EXAMPLES 2, 3, and 4

on pp. 776–777 for Exs. 8–10

## 12.3 Divide Polynomials

pp. 784–791

### EXAMPLE

Divide  $x^2 + 7x - 2$  by  $x - 2$ .

$$\begin{array}{r}
 \phantom{x^2} x + 9 \\
 x - 2 \overline{) x^2 + 7x - 2} \\
 \underline{x^2 - 2x} \phantom{- 2} \\
 9x - 2 \\
 \underline{9x - 18} \\
 16
 \end{array}$$

**Multiply  $x$  and  $x - 2$ .**  
**Subtract  $x^2 - 2x$ . Bring down  $-2$ .**  
**Multiply  $9$  and  $x - 2$ .**  
**Subtract  $9x - 18$ .**

▶  $(x^2 + 7x - 2) \div (x - 2) = x + 9 + \frac{16}{x-2}$

### EXERCISES

Divide.

11.  $(x^2 + 12x + 35) \div (x + 7)$

12.  $(y^2 - 5y - 8) \div (y - 3)$

13.  $(4z + z^2 - 1) \div (5 + z)$

14.  $(3a^2 - 2) \div (3 + 3a)$

15. **CHARITY DONATIONS** Sean intends to collect \$500 in individual donations for a charity. His company will contribute \$2 for every donation collected. Write and graph an equation that gives the average amount  $a$  (including the company contribution) that the charity will receive per individual donation as a function of the number  $d$  of donations.

### EXAMPLES 2, 3, 4, 5, and 7

on pp. 785–787 for Exs. 11–15