12.2 EXERCISES

HOMEWORK KEY

- = **WORKED-OUT SOLUTIONS** on p. WS1 for Exs. 7, 21, and 41
- = **TAKS PRACTICE AND REASONING** Exs. 18, 28, 29, 42, 44, 46, and 47
- = **MULTIPLE REPRESENTATIONS** Ex. 41

SKILL PRACTICE

1. **VOCABULARY** Identify the vertical asymptote and horizontal asymptote of the graph of $y = \frac{1}{x - 3} - 6$.

2. **WRITING** *Describe* the difference between the graph of $y = \frac{1}{x + 2}$ and the graph of $y = \frac{1}{x}$.

EXAMPLES 1, 2, and 3 on pp. 775–776 for Exs. 3–17

GRAPHING FUNCTIONS **Graph the function and identify its domain and range. *Compare* the graph with the graph of $y = \frac{1}{x}$.**

3. $y = \frac{3}{x}$
4. $y = \frac{1}{2x}$
5. $y = \frac{-3}{x}$
6. $y = \frac{-2}{3x}$
7. $y = \frac{-1}{4x}$
8. $y = \frac{1}{x} + 7$
9. $y = \frac{1}{x} - 5$
10. $y = \frac{1}{x} + 4$
11. $y = \frac{1}{x} + 8$
12. $y = \frac{1}{x} - 6$
13. $y = \frac{1}{x + 3}$
14. $y = \frac{1}{x - 7}$
15. $y = \frac{1}{x + 8}$
16. $y = \frac{1}{x - 1}$
17. $y = \frac{1}{x - 6}$

EXAMPLE 4 on p. 777 for Exs. 18–31

18. **TAKS REASONING** For which function is the domain all real numbers except -5 and the range all real numbers except 0?

(A) $y = \frac{5}{x}$ (B) $y = \frac{5}{x - 5}$ (C) $y = \frac{5}{x + 5}$ (D) $y = \frac{-5}{x - 5}$

GRAPHING FUNCTIONS **Graph the function.**

19. $y = \frac{1}{x - 2} - 8$
20. $y = \frac{2}{x - 6} + 3$
21. $y = \frac{4}{x + 7} + 5$
22. $y = \frac{-3}{x + 3} - 4$
23. $y = \frac{-1}{x + 5} + 6$
24. $y = \frac{2}{x - 1} + 2$
25. $y = \frac{1}{x - 4} + 2$
26. $y = \frac{4}{x - 3} - 1$
27. $y = \frac{-5}{x - 1} - 4$

28. **TAKS REASONING** The graph of which function has the same horizontal asymptote as the graph of $y = \frac{1}{x}$?

(A) $y = \frac{2}{x} + 3$ (B) $y = \frac{1}{x} - 1$ (C) $y = \frac{-10}{x}$ (D) $y = \frac{-10}{x - 1} + 1$

29. **TAKS REASONING** Write an equation whose graph is a hyperbola that has the following characteristics:
   - The vertical asymptote is $x = -1$.
   - The horizontal asymptote is $y = 2$.