

# Practice 12-1 through 12-3

## Rational Functions

Describe the graph of each function.

1.  $f(x) = x^2 - 4$

2.  $y = \frac{5}{x} - 1$

3.  $y = \frac{3}{x}$

4.  $g(x) = \sqrt{x + 2} - 1$

5.  $y = -8x + 2$

6.  $h(x) = 3x^2 - 4x + 1$

7.  $h(x) = |2x + 7|$

8.  $y = 0.2^x$

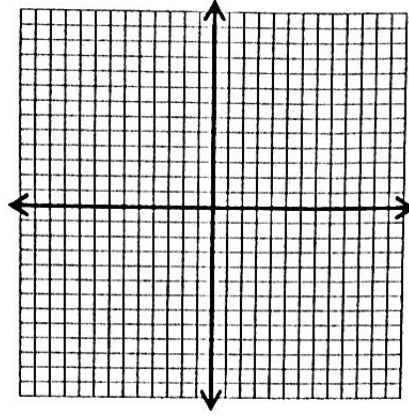
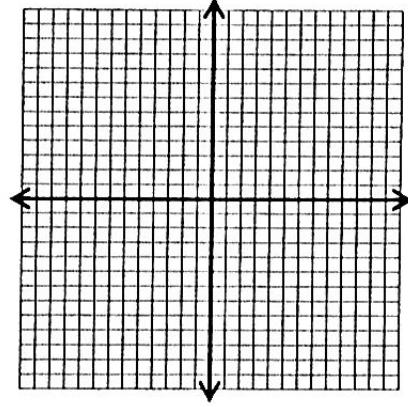
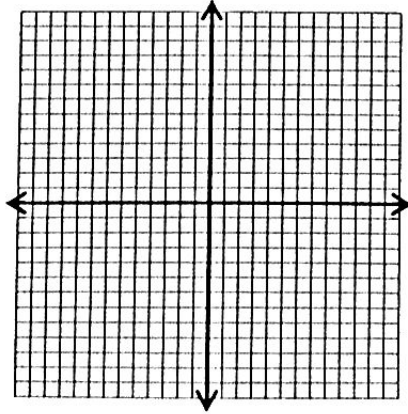
9.  $y = \frac{x}{4}$

Identify the vertical asymptote of each function. Then graph the function.

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

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

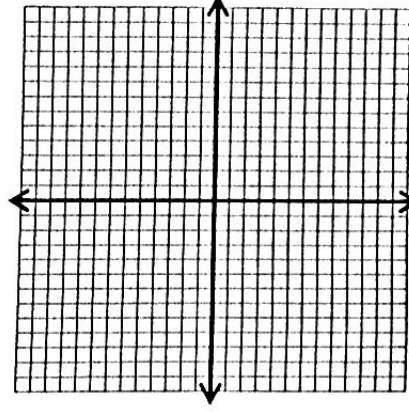
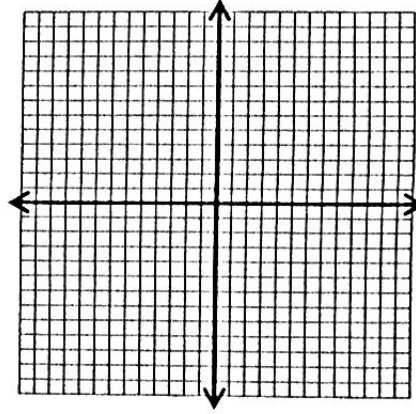
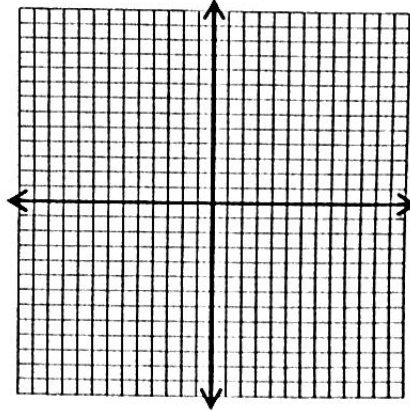
12.  $y = \frac{1}{x+4}$



13.  $y = \frac{2}{x} + 3$

14.  $y = \frac{2x}{x-6}$

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



Simplify each expression.

16.  $\frac{6x^4}{18x^2}$

17.  $\frac{3x-6}{6}$

18.  $\frac{x^2+3x}{3x+9}$

19.  $\frac{x^2-9}{x^3-3x^2}$

20.  $\frac{x^2+2x-15}{x^3-7x+12}$

21.  $\frac{x^2+3x-10}{25-x^2}$

Multiply or divide.

22.  $\frac{5}{9} \cdot \frac{6}{15}$

23.  $\left(-\frac{3}{4}\right) \div \frac{16}{21}$

24.  $\frac{4m^3}{11} \cdot \frac{33n}{36m^2}$

25.  $\frac{a^2-4}{3} \cdot \frac{9}{a+2}$

26.  $\frac{5y^3}{7} \cdot \frac{14y}{30y^2}$

27.  $\frac{3(h+2)}{h+3} \div \frac{h+2}{h+3}$

28.  $\frac{x^2-x}{x} \cdot \frac{3x-6}{3x-3}$

29.  $\frac{x^2-16}{x-4} \div \frac{3x+12}{x}$

30.  $\frac{x^2+2x-35}{x^2+4x-21} \cdot \frac{x^2+3x-18}{x^2+9x+18}$

31.  $\frac{3x^2+14x+8}{2x^2+7x-4} \cdot \frac{2x^2+9x-18}{3x^2+16x+3}$

32.  $\frac{8+2x-x^2}{x^2+7x+10} \div \frac{x^2-11x+28}{x^2-x-42}$