

**Section 7.4 Extra Practice**

1. For each function,
- write the reciprocal function
  - state the domain of the function and of its reciprocal function
  - state the range of the function and of its reciprocal function

a)  $y = x + 4$                       b)  $y = 3x - 9$   
 c)  $y = (x + 2)(x - 2)$       d)  $y = x^2 + 6x + 9$

2. For each function,
- state the zeros
  - write the reciprocal function
  - identify the non-permissible values of the corresponding rational expression
  - state the equation(s) of the vertical asymptote(s)

a)  $f(x) = 3 + x$   
 b)  $g(x) = 2x - 1$   
 c)  $h(x) = (x + 2)(x - 3)$   
 d)  $j(x) = -2x^2 - 12x - 10$

3. State the equation(s) of the vertical asymptote(s) for each function.

a)  $f(x) = \frac{1}{5 - x}$   
 b)  $g(x) = \frac{1}{7x - 2}$   
 c)  $h(x) = \frac{1}{(x + 1)(2x + 1)}$   
 d)  $h(x) = \frac{1}{2x^2 + 2x - 24}$

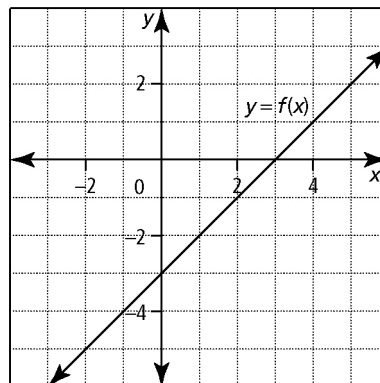
4. What are the  $x$ -intercepts and  $y$ -intercepts of each function?

a)  $y = \frac{1}{2x + 5}$   
 b)  $y = \frac{1}{3 - 2x}$   
 c)  $f(x) = \frac{1}{(2x + 3)(x - 1)}$   
 d)  $g(x) = \frac{1}{x^2 + 7x + 12}$

5. Sketch the graph of  $y = f(x)$  and the graph of  $y = \frac{1}{f(x)}$  on the same set of axes. Label the asymptotes, the invariant points, and the intercepts.

a)  $f(x) = x + 2$   
 b)  $f(x) = 3x$   
 c)  $f(x) = (x - 3)(x + 3)$   
 d)  $f(x) = (x + 1)^2$

6. Copy the graph of  $y = f(x)$ , and sketch the graph of the reciprocal function,  $y = \frac{1}{f(x)}$ .



7. Copy the graph of  $y = \frac{1}{f(x)}$ , and sketch the graph of  $y = f(x)$ .

