

## Practice

## Graphs of Rational Functions

Determine the equations of the vertical and horizontal asymptotes, if any, of each function.

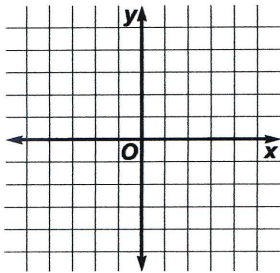
1.  $f(x) = \frac{4}{x^2 + 1}$

2.  $f(x) = \frac{2x + 1}{x + 1}$

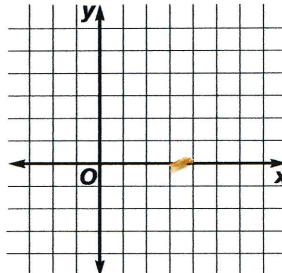
3.  $g(x) = \frac{x + 3}{(x + 1)(x - 2)}$

Use the parent graph  $f(x) = \frac{1}{x}$  to graph each equation. Describe the transformation(s) that have taken place. Identify the new locations of the asymptotes.

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



5.  $y = -\frac{4}{x - 3} + 3$

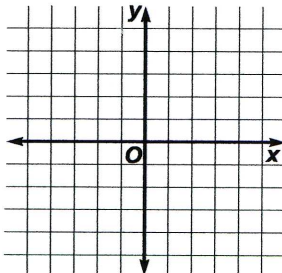


Determine the slant asymptotes of each equation.

6.  $y = \frac{5x^2 - 10x + 1}{x - 2}$

7.  $y = \frac{x^2 - x}{x + 1}$

8. Graph the function  $y = \frac{x^2 + x - 6}{x + 1}$ .



9. **Physics** The illumination  $I$  from a light source is given by the formula  $I = \frac{k}{d^2}$ , where  $k$  is a constant and  $d$  is distance. As the distance from the light source doubles, how does the illumination change?