

# 7.2 Graphing Rational Functions



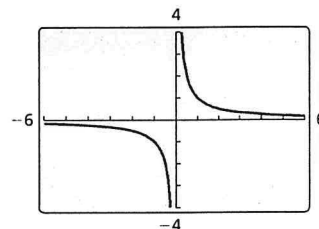
Learning Standards  
HSA-APR.D.6  
HSF-BF.B.3

**Essential Question** What are some of the characteristics of the graph of a rational function?

The parent function for rational functions with a linear numerator and a linear denominator is

$$f(x) = \frac{1}{x} \quad \text{Parent function}$$

The graph of this function, shown at the right, is a *hyperbola*.



## EXPLORATION 1 Identifying Graphs of Rational Functions

**Work with a partner.** Each function is a transformation of the graph of the parent function  $f(x) = \frac{1}{x}$ . Match the function with its graph. Explain your reasoning. Then describe the transformation.

a.  $g(x) = \frac{1}{x-1}$

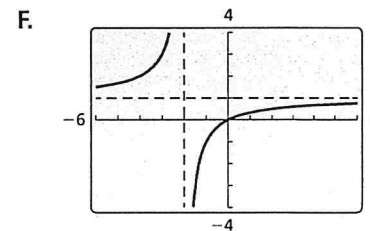
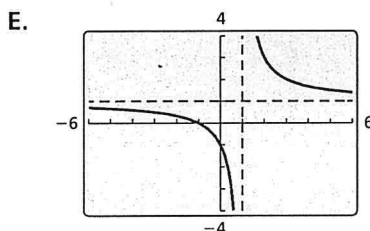
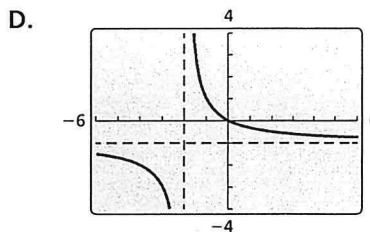
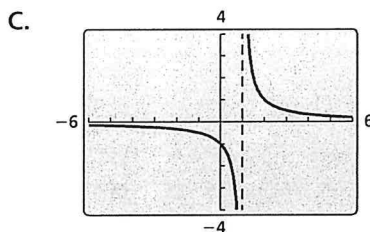
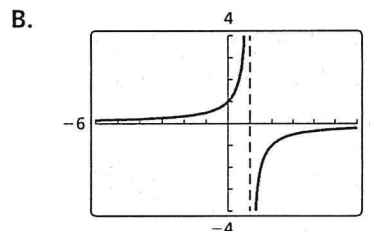
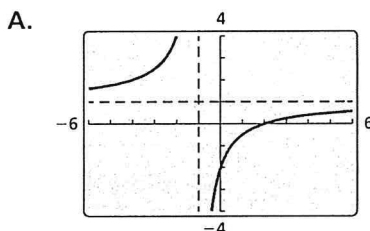
b.  $g(x) = \frac{-1}{x-1}$

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

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

e.  $g(x) = \frac{x}{x+2}$

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



### LOOKING FOR STRUCTURE

To be proficient in math, you need to look closely to discern a pattern or structure.

### Communicate Your Answer

2. What are some of the characteristics of the graph of a rational function?
3. Determine the intercepts, asymptotes, domain, and range of the rational function  $g(x) = \frac{x-a}{x-b}$ .