

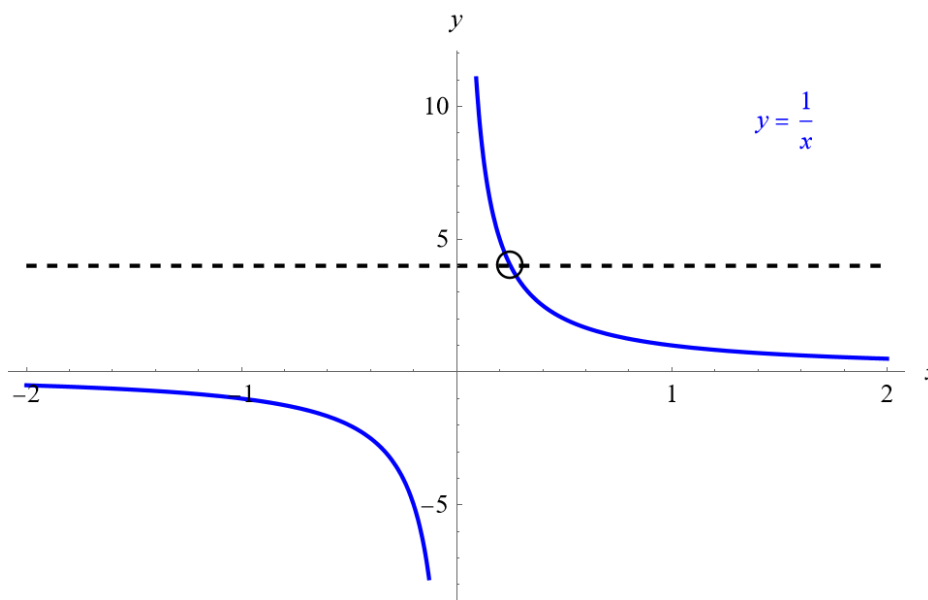
## Exercise 327

Are the following functions one-to-one over their domain of existence? Does the function have an inverse? If so, find the inverse  $f^{-1}(x)$  of the function. Justify your answer.

$$f(x) = \frac{1}{x}$$

### Solution

This is the graph of a hyperbola. Because it passes the horizontal line test,  $f(x)$  is one-to-one and therefore has an inverse.



Replace  $x$  with  $y$ , and replace  $f(x)$  with  $x$  in the equation.

$$x = \frac{1}{y}$$

Solve for  $y$ , the inverse function.

$$y = \frac{1}{x}$$

The function and its inverse are one and the same.