

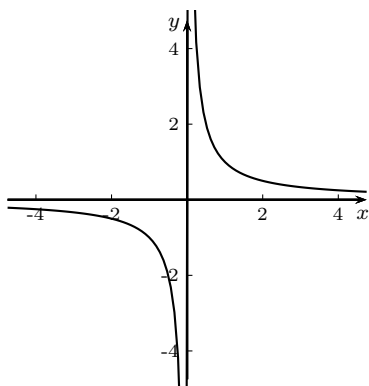
Precalculus, Section 4.4, #38
Properties of Rational Functions

Graph each rational function using transformations.¹

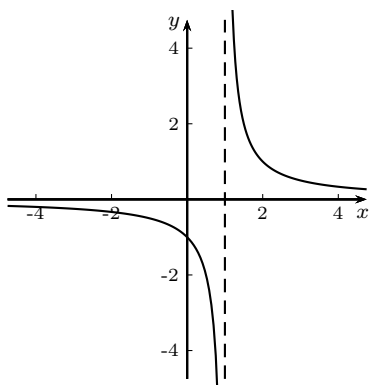
$$R(x) = \frac{1}{x-1} + 1$$

Here, the domain of $R(x)$ is all x -values such that $x \neq 1$.

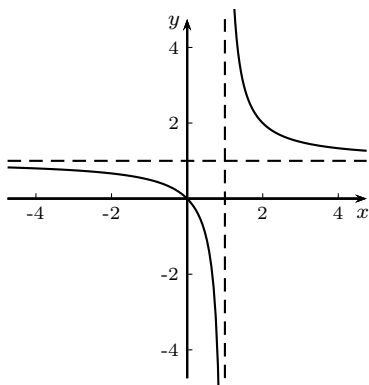
The basic function for $R(x)$ is $y = \frac{1}{x}$. Note that the basic function has a vertical asymptote at $x = 0$, and a horizontal asymptote at $y = 0$. The graph of $y = \frac{1}{x}$ is shown below.



The $x - 1$ in the denominator, will translate the graph of the basic function—and its vertical asymptote—one unit to the right.



Finally, the “+1” in the function will translate the graph—and its horizontal asymptote—up one unit.



¹Sullivan, *Precalculus: Enhanced with Graphing Utilities*, p. 225, #38.