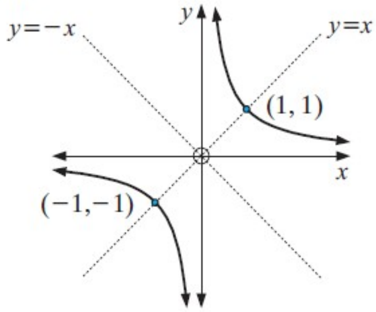
Focus on Reciprocal Functions

$x \mapsto \frac{1}{x}$, i.e., $f(x) = \frac{1}{x}$ is defined as the **reciprocal function**.

It has graph:



- $f(x) = \frac{1}{x}$ is **asymptotic** to the x-axis and to the y-axis.

[The graph gets closer to the axes as it gets further from the origin.]

Notice that:

- $f(x) = \frac{1}{x}$ is meaningless when $x = 0$
- The graph of $f(x) = \frac{1}{x}$ exists in the first and third quadrants only.
- $f(x) = \frac{1}{x}$ is symmetric about $y = x$ and $y = -x$
- as $x \to \infty$, $f(x) \to 0$ (from above)
  as $x \to -\infty$, $f(x) \to 0$ (from below)
  as $x \to 0$ (from right), $y \to \infty$
  as $x \to 0$ (from left), $y \to -\infty$
  $\to$ reads *approaches* or *tends to*

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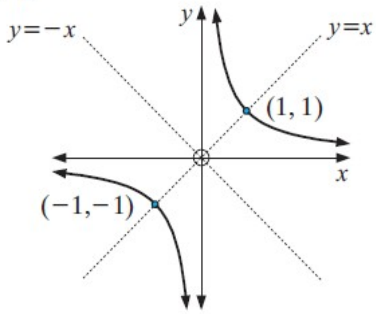

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