5.1 Reciprocals

The reciprocal of a number is 1 divided by that number

- 4 is the reciprocal of $\frac{1}{4}$
- $\frac{5}{6}$ is the reciprocal of $\frac{6}{5}$
- x^{-1} is the reciprocal of x and x is the reciprocal of $\frac{1}{x}$

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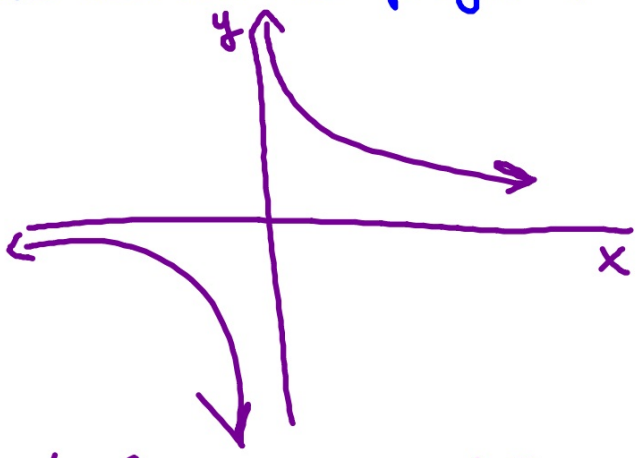
5.2 The reciprocal function

The reciprocal function is $f(x) = \frac{K}{x}$, where K is constant

* take 10 minutes and do the Investigation on the bottom of page 143



The graph of any reciprocal function of the form $y = \frac{K}{x}$ has a vert. asymp. at $x=0$ & horiz at $y=0$

The graph of the reciprocal function is called a hyperbola

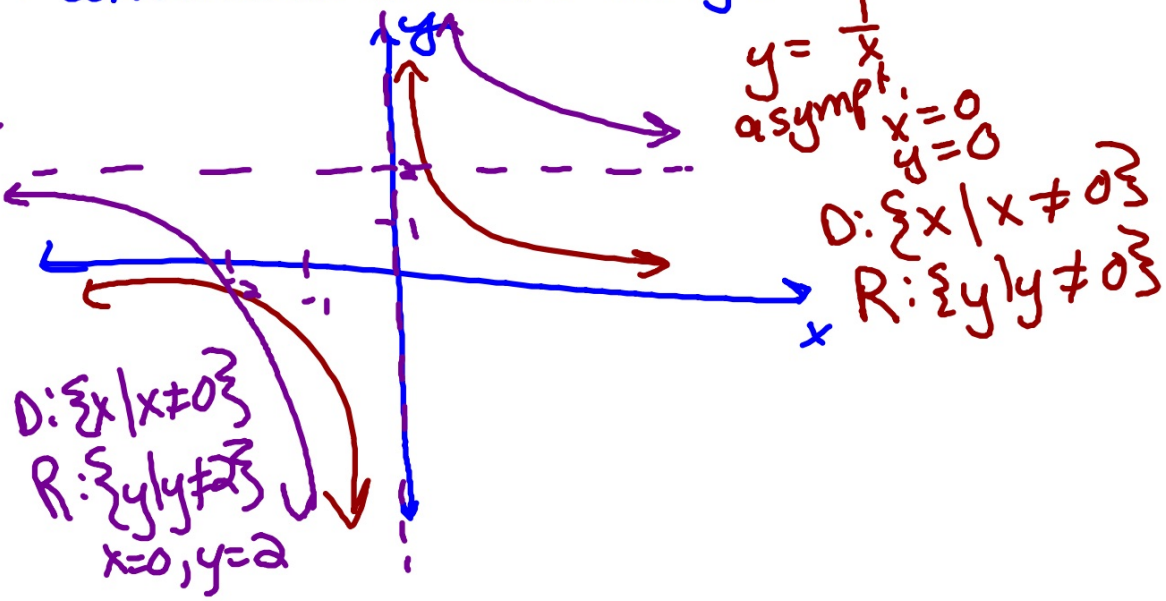
- x-axis is horiz. asymptote ($y=0$)
- y-axis is vert. asymptote ($x=0$)
- Domain: $\{x \mid x \neq 0\}$ or $(-\infty,0) \cup (0,\infty)$
- Range: $\{y \mid y \neq 0\}$ or $(-\infty,0) \cup (0,\infty)$
- the two parts of the graph are reflections of each other over $y=x$
- $y=-x$ and $y=x$ are both lines of symmetry

Ex Sketch the graph of $y = \frac{9}{x} + 2$ and $y = \frac{1}{x}$.

- write down the equations of the asymp's
- Sketch graph
- write down Domain + Range

$y = \frac{9}{x} + 2$

x	y
-2	$\frac{-5}{0}$
-1	-7
0	und
1	11
2	$\frac{13}{2}$



$y = \frac{1}{x}$
asympt: $x = 0$, $y = 0$
D: $\{x \mid x \neq 0\}$
R: $\{y \mid y \neq 0\}$

D: $\{x \mid x \neq 0\}$
R: $\{y \mid y \neq 2\}$
$x = 0, y = 2$

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