C12 - 9.1 - Graph TOV HT xy-int Notes

$$y = \frac{a}{x - h} + k$$

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

$y = \frac{1}{\left(-\frac{1}{10}\right)}$

$y = 1\left(-\frac{10}{1}\right)$

$y = -10$
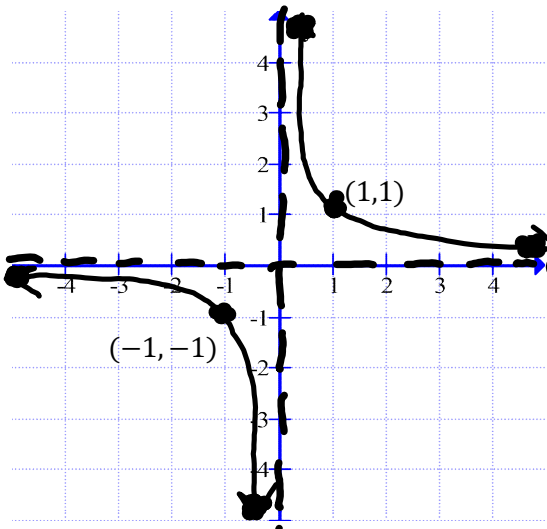
x	y
-5	$-\frac{1}{5} = -0.2$
-1	-1
$-\frac{1}{10} = -0.1$	-10
0	und
$\frac{1}{10} = 0.1$	10
1	1
5	$\frac{1}{5}$

$(1,1)$

$(-1,-1)$

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

$HA:\ y = 0$

$HA:\ y = k$

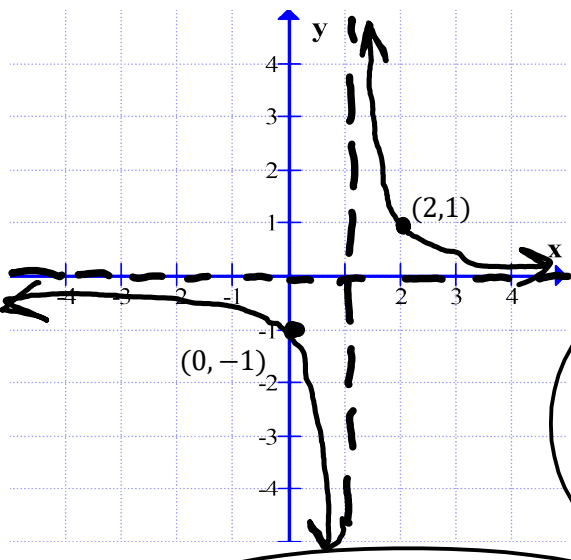$VA:\ x = 0$

VA: Set Denominator $= 0$ *and solve*

$x = 0$ Domain: $x \neq 0$

$x - int:$ $y = \frac{1}{x}$ $0 = \frac{1}{x}$ $0 \neq 1$

$y - int:$ $y = \frac{1}{x}$ $y = \frac{1}{0}$ $y \neq$

$HT = +1$

$(2,1)$

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

$HA:\ y = 0$

$Range$

$y \neq 0$

$(0,-1)$

$VA:\ x = 1$ Domain: $x \neq 1$

End Behavior

$x \to \infty,\qquad y \to 0^+$

$x \to -\infty,\qquad y \to 0^-$

As x gets close to …

Behavior near Asymptote

$x \to 1^+,\qquad y \to \infty$

$x \to 1^-,\qquad y \to -\infty$

$VA:$

$x - 1 = 0$

$x = 1$

$x - int:$

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

$0 = \frac{1}{x - 1}$

Careful! $(x - 1) \times 0 = \frac{1}{x - 1} \times (x - 1)$

$0 \neq 1$

$y - int:$

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

$y = \frac{1}{0 - 1}$

$y = -1$

$(0,-1)$

x	y
0	-1
1	und
2	1