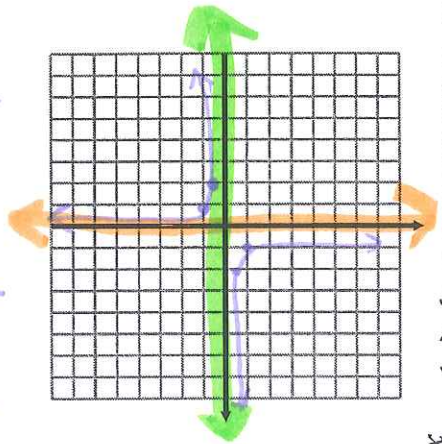


① Graph VA & HA
 $f(x) = \frac{1}{x}$

VA: $x=0$

HA: $y=0$

② Make table →
 pick points to
 right & left of VA

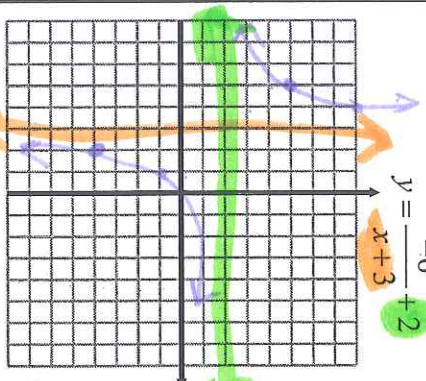


x	-2	-1	0	1	2
y	-1/2	-1		1	1/2

Ex. 1: Graph the function $f(x) = \frac{1}{x}$

Ex. 3: Graph the function

$y = \frac{-6}{x+3} + 2$



x	-5	-4	-3	-2	-1
y	5	8		4	1

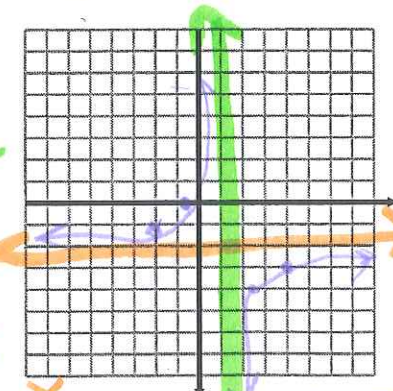
HA: $y=2$

VA: $x=-3$

Domain: \mathbb{R} except $x=-3$
 Range: \mathbb{R} except $y=2$

Try it! Graph the function

$y = \frac{3}{x-2} + 1$



x	-1	0	1	2	3	4
y	1.5	2	2.5		4	4.5

HA: $y=1$

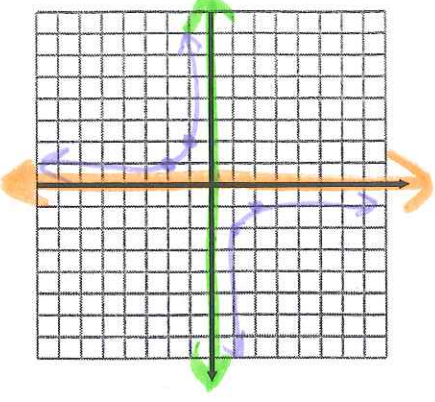
VA: $x=2$

Domain: \mathbb{R} except $x=2$
 Range: \mathbb{R} except $y=1$

Try it! Graph the function $y = \frac{2}{x}$

HA: $y=0$

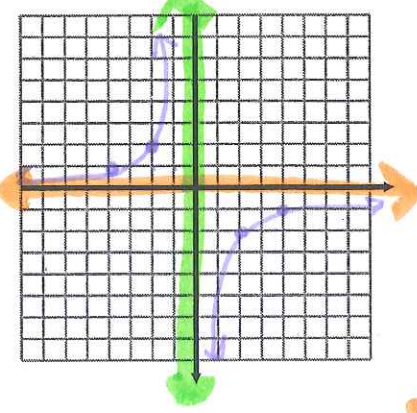
VA: $x=0$



Ex. 2: Graph the function $y = \frac{4}{x}$

HA: $y=0$

VA: $x=0$



HA: $y=0$

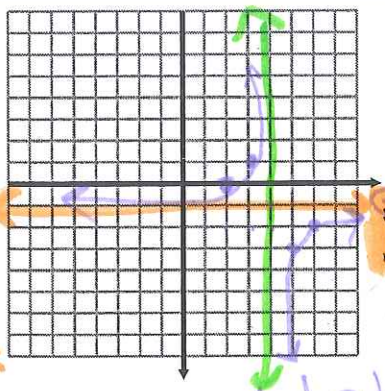
VA: $x=0$

Domain: \mathbb{R} except $x=0$
 Range: \mathbb{R} except $y=0$

x	-2	-1	0	1	2
y	-1	-2		1	2

Ex. 4: Graph the function

$y = \frac{4x-2}{x-1}$



x	1/4	1/2	3/4	1	5/4
y	0	1	2		5

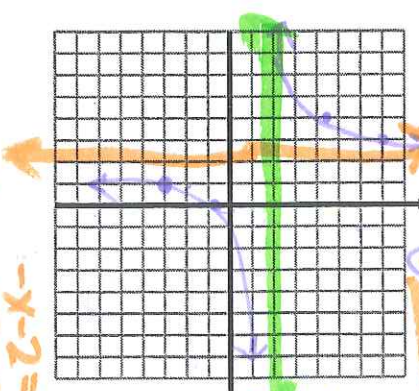
HA: $y=4$

VA: $x=1$

Domain: \mathbb{R} except $x=1$
 Range: \mathbb{R} except $y=4$

Try it! Graph the function

$y = \frac{-2x+1}{-x-2}$



x	1/4	1/2	3/4	1	5/4
y	0	1	2		5

HA: $y=2$

VA: $x=-2$

Domain: \mathbb{R} except $x=-2$
 Range: \mathbb{R} except $y=2$

Case 2:

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

HA: $y = k$

Parent Function:

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

Domain: $x \neq 0$
Range: $y \neq 0$

Vertical Asymptote (VA):

set denominator = 0
 $x = 0$

Horizontal Asymptote (HA): $y = 0$

3 cases

Case 3:

$$y = \frac{ax+b}{cx+d}$$

degree of den =

degree of num

HA: $y = \frac{a}{c}$

Case 1:

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

degree of den > degree of num

HA: $y = 0$

a function of the form $f(x) = \frac{p(x)}{q(x)}$ where $p(x)$ and $q(x)$ are polynomials and $q(x) \neq 0$.

Rational Function: