October 18, 2017

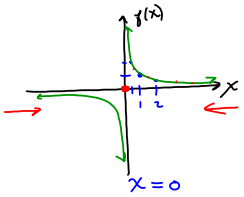
Rational Functions

$$f(x) = \frac{p(x)}{q(x)} \qquad q(x) \neq 0$$

Oct 18-8:07 AM

$$f(x) = \frac{1}{x} \qquad *x \neq 0$$

$D: (-\infty, 0) \cup (0, \infty)$



$x = 0$

V. A. : $x = 0$

x	$f(x)$
1	1
-1	-1
2	1/2
-2	-1/2
1/2	2

Oct 18-8:18 AM

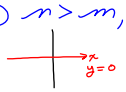
Finding Asymptotes

$$r(x) = \frac{a_n x^n \ldots}{b_m x^m \ldots}$$

① Vertical Asymptote: Setting the Denominator equal to zero & solve.

② Horizontal Asymptote:

(a) $n > m$, then H.A. is $y = 0$ i.e. x-axis



(b) $n = m$, then H.A. is $y = \frac{a_n}{b_m}$ i.e. the leading Coeffients of the numerator and denominator.

(c) $n < m$, then no H.A.

Oct 18-8:27 AM

$$f(x) = \frac{x^3 - 2x^2 - 3x}{x - 3}$$

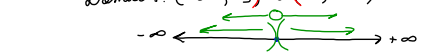
Degree: 3 (numerator) } 3 > 1

Degree: 1 (denominator)

$x - 3 \neq 0$

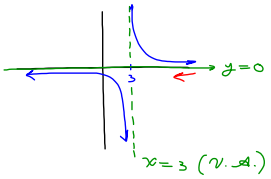
$x \neq 3$

Domain: $(-\infty, 3) \cup (3, \infty)$



Vertical Asm.: $x = 3$

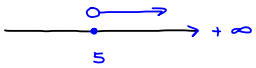
Horizontal Asm.:



$x = 3$ (V. A.)

Oct 18-8:37 AM

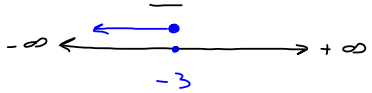
$x > 5$



$5 > 5$ false!

$(5, \infty)$

$x \leq -3$



$-3 \leq -3$ true

$(-\infty, -3]$

Oct 18-8:42 AM