

Nov. 2, 2018

Sect. 7-2

Rational Facts

Defn.

Vert. Asymptotes/Holes

Horiz Asymptotes

Oblique Asym.

Solving

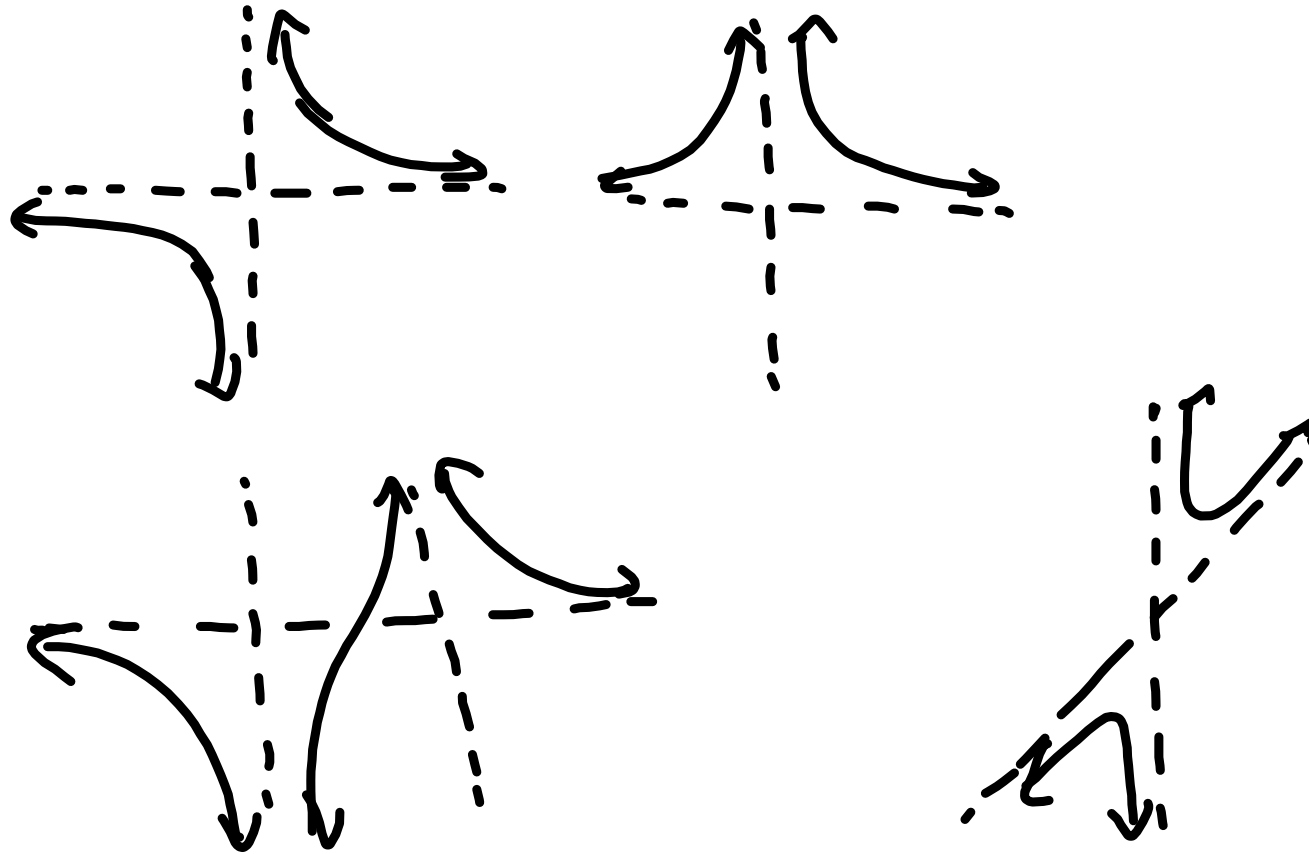
Def: A fract that has a variable
in the denom.

$$R(x) = \frac{N(x)}{D(x)}$$

e.g. $f(x) = \frac{1}{x}$

$$g(x) = \frac{x+2}{2x-5}$$

$$h(x) = \frac{3x^2 + 2x - 5}{x+6}$$



Vert. Asym / Hole

Where? When denom = 0 *
 * and numer \neq 0

Find the eqn
 of the V.A.

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

V.A. $x = 0$

$$f(x) = \frac{x+6}{x-3}$$

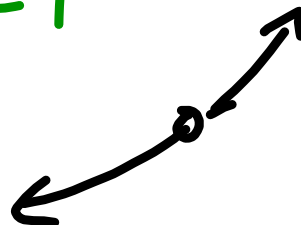
V.A. : $x = 3$

$$f(x) = \frac{x-1}{x^2-3x+2}$$

$$\frac{x-1}{(x-2)(x-1)}$$

V.A. $x=2$ ~~$x=1$~~

Hole @ $x=1$



Vocab.

Degree: $2x^3$ deg = 3
 $-5x^2$ 2
 $4x^2 + 3x - 6$ 2

Leading Coefficient: The coeff. of the highest deg. term
 $4x^2 + 3x - 6$ l.c. = 4
 $4x - 5x^2 + 1$ l.c. = -5

Horiz. Asym Rules

1. If $\deg D > \deg N$, then H.A. $\therefore y = 0$ ^{x-axis}
2. If $\deg D = \deg N$, then H.A. $\therefore y = \frac{\text{l.c.}}{\text{d.c.}}$
3. If $\deg D < \deg N$, then none

Find the eq. of H.A.

$$f(x) = \frac{2x + 3}{x^2 - 5}$$

$$\text{H.A.} : y = 0$$

$$g(x) = \frac{6 + 5x}{2x - 3}$$

$$\text{H.A.} : y = \frac{5}{2}$$

$$h(x) = \frac{3x^2 + 2x - 5}{x + 6}$$

$$\text{H.A.} : \text{none}$$

Oblique Asym.

If $\deg N$ is exactly one more than $\deg D$
then O.A.

Find the eqn?

Do the division

O.A : $y = \text{quotient}$
(throw remainder away)

$$h(x) = \frac{3x^2 + 2x - 5}{x + 6}$$

Long Div.:

$$\begin{array}{r|rr} -6 & 3 & 2 & -5 \\ & \downarrow & -18 & \\ \hline & 3 & -16 & \end{array}$$

$\begin{matrix} D \\ \text{of} \\ \text{Car} \end{matrix}$

$$Y = 3x - 16$$

Solving

$$\frac{x+2}{x-5} \stackrel{\text{red X}}{\neq} \underset{\text{blue } \perp}{3}^*$$

$$3(x-5) = 1(x+2)$$

$$3x - 15 = x + 2$$

$$2x = 17$$

$$x = \frac{17}{2} \checkmark \text{ or } 8\frac{1}{2} \checkmark \text{ or } 8.5 \checkmark$$

* Is it okay?
 $x \neq 5$