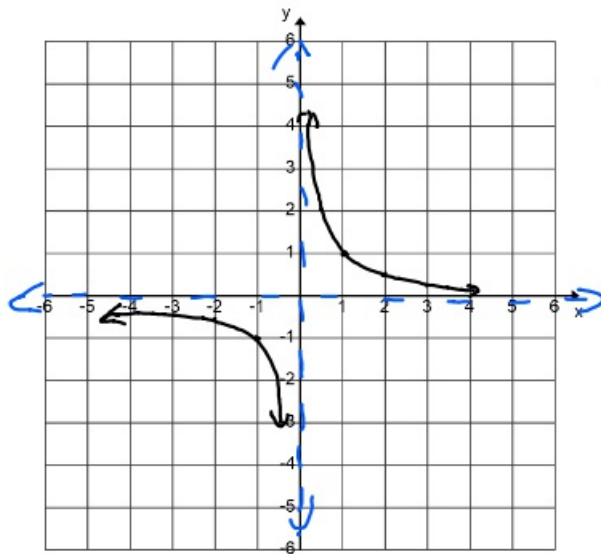


1-8-20 1st Trig



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

Horizontal Asymptotes

Bobo: Bigger on Bottom $y=0$

Botn: Bigger on Top None

Eats DC: Exponents are the Same:

Divide Coefficients

$$\textcircled{1} f(x) = \frac{x^3 + 6x - 1}{x - 8}$$

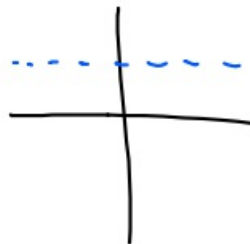
Bobo Botn Eats DC
None

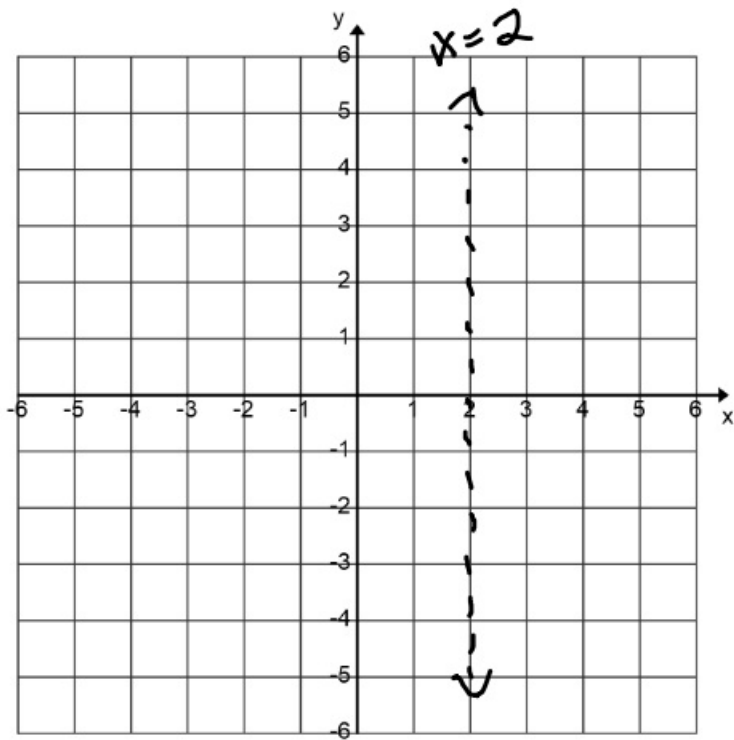
$$\textcircled{2} f(x) = \frac{3x^4 + 2x - 1}{x^4 - 5}$$

Bobo
Botn
Eats DC

$$y = \frac{3}{1}$$

$$y = 3$$





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

Vertical
Asymptote
consentrate
on
denominator

$$\textcircled{3} f(x) = \frac{x^{300} - 2x + 1}{4x - 12}$$

Vertical: $4x - 12 = 0$
 $x = 3$



$$\textcircled{4} f(x) = \frac{8}{x^2 + 7x + 12}$$

$$x^2 + 7x + 12 = 0$$

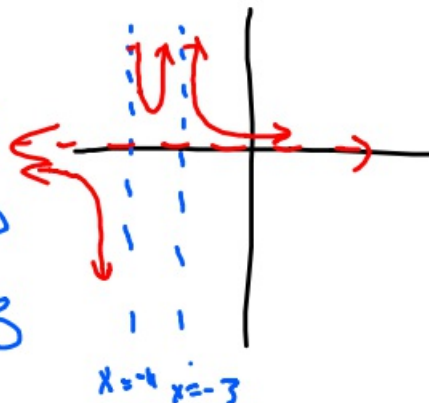
$$(x+4)(x+3) = 0$$

$$x+4=0$$

$$x+3=0$$

$$x = -4$$

$$x = -3$$



Slant Asymptote

Only occurs when top is 1 degree higher than the bottom.

$$\text{Ex: } f(x) = \frac{x^2 + 7x + 1}{x + 2}$$

To find the slant asymptote:

$$\begin{array}{r} \textcircled{x+5} \\ x+2 \overline{) x^2 + 7x + 1} \\ \underline{-(x^2 + 2x)} \\ 5x + 1 \\ \underline{5x + 10} \\ -9 \end{array}$$

Slant at $y = x + 5$

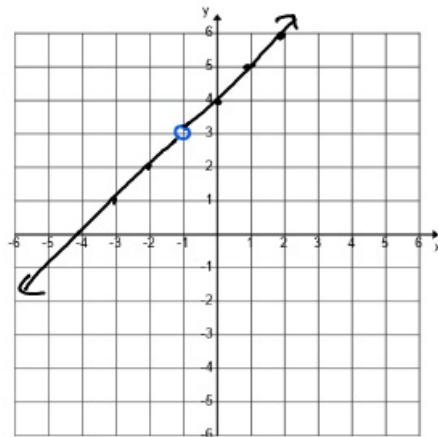
Don't worry about remainder

$$\text{Graph } y = \frac{x^2 + 5x + 4}{x + 1}$$

Looks like vertical at $x = -1$ and looks like a slant asymptote

$$\text{Notice } y = \frac{\cancel{(x+1)}(x+4)}{\cancel{x+1}}$$

All we have $y = x + 4$ [$x \neq -1$]



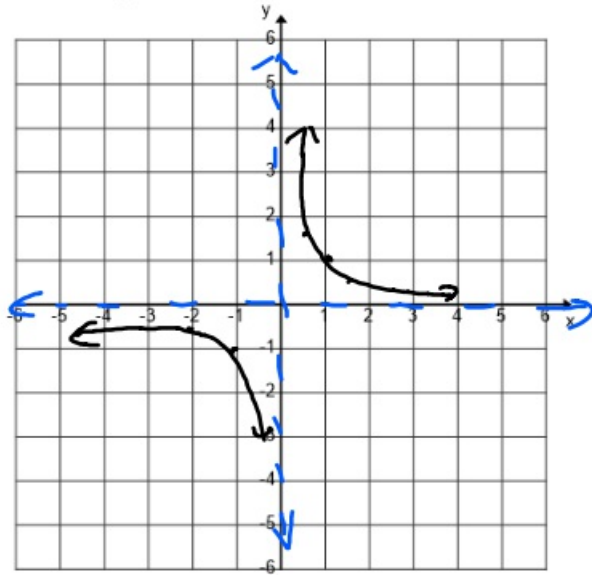
$$\textcircled{11} \quad y = \frac{x^2 - x - 2}{x + 2}$$

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

No hole.

$$\text{Slant: } x+2 \overline{) x^2 - x - 2}$$

1-8-20 3rd Trig



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

Horizontal Asymptotes

Bobo
 $y=0$

Botn
none

Eats DC
Divide coefficients

$$\textcircled{1} f(x) = \frac{x^{\textcircled{4}} + 6x - 1}{x^{\textcircled{2}} + 6x + 5}$$

Bigger on Top

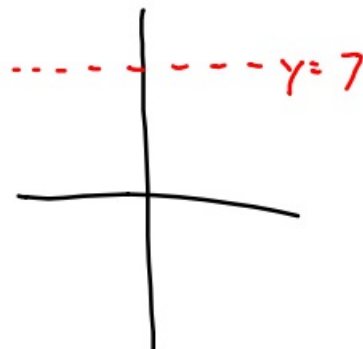
BOT(N) NONE

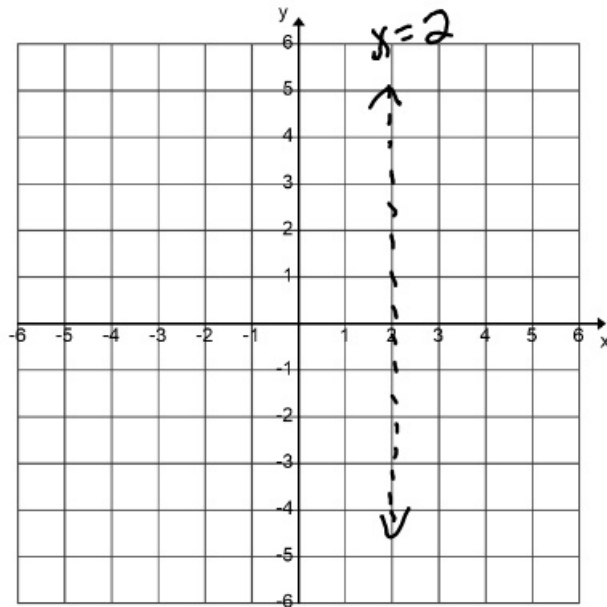
$$\textcircled{2} f(x) = \frac{\boxed{7}x^{\textcircled{3}} + 6x^2 - 1}{\boxed{1}x^{\textcircled{3}} - 9}$$

EATS DC

$$y = \frac{7}{1}$$

$$y = 7$$

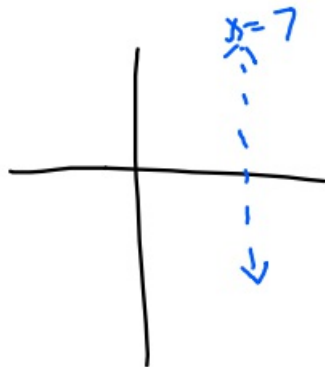




$$y = \frac{5}{x-2}$$

③ Vertical Asymptote

$$f(x) = \frac{5x^{160} - 6x^{71} + 1}{3x - 21}$$



$$3x - 21 = 0$$

$$x = 7$$

④ $f(x) = \frac{19}{x^2 + 6x + 5}$

$$x^2 + 6x + 5 = 0$$

$$(x+5)(x+1) = 0$$

$$x+5 = 0 \quad x+1 = 0$$

$$x = -5 \quad x = -1$$

