1-27-14

3rd Trig

Asymptotes

Horizontal ——————

Bobo → $y = 0$

Botn → None

Eats DC → divide coef.

Vertical ↕ $x = \square$

What x can't be in the denominator.

$$y = \frac{x^4 + 6x - 1}{x + 7}$$

Vertical Asymptote at $x = -7$

Slant Asymptotes

only occurs when top is one degree larger.

Hole

will occur when you factor top and bottom and you cancel out something.

① $$y = \frac{x^2 + 6x + 5}{x + 2}$$

$$= \frac{(x+1)(x+5)}{x+2}$$

No hole

$$y = \frac{x^2+6x+5}{x+2}$$

Slant $\rightarrow$

$$x+2 \overline{)\, x^2+6x+5}$$

$x + 4$

$-x^2+2x$

$4x+5$

$4x+8$

-3

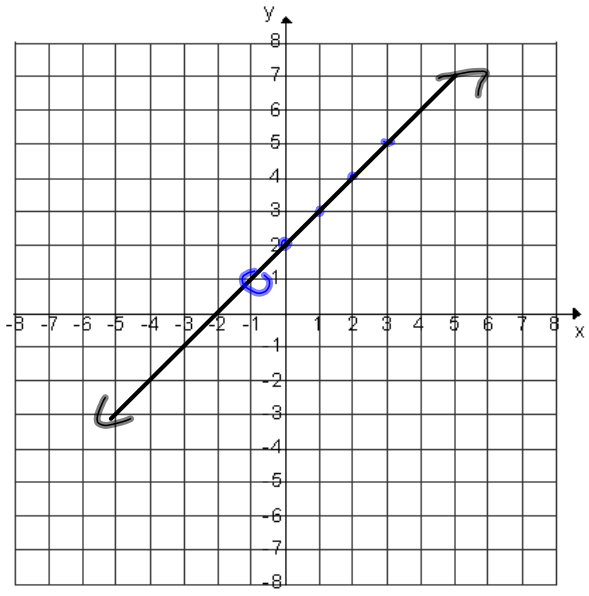
$y = x+4$

② $$y = \frac{x^2+3x+2}{x+1}$$

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

$y = x+2 \quad [x \neq -1]$

Hole at $x = -1$



(3) $y = \dfrac{6x^4 + 61}{3x^4 + 2x^3 - 1}$

H: Eats PC

$y = \frac{6}{3} = 2$

V: Too difficult. Sorry!

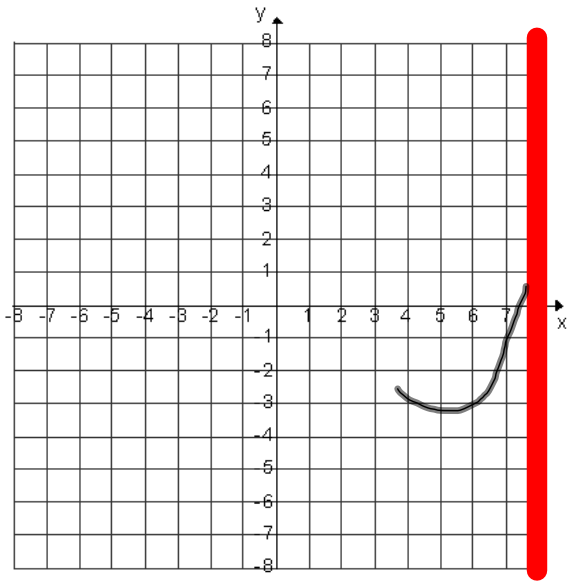
(4) $y = \dfrac{x^4 + 6x + 1}{x - 8}$

H: Both None

V: $x - 8 \neq 0$

$x \neq 8$

∴ draw line at $x = 8$



⑤ $y = \dfrac{x^5 - 6x + 1}{x^2 - 4}$

H: Bot None

V: $x^2 - 4 \neq 0$

$x \neq 2, -2$

$x = 2$ and $x = -2$

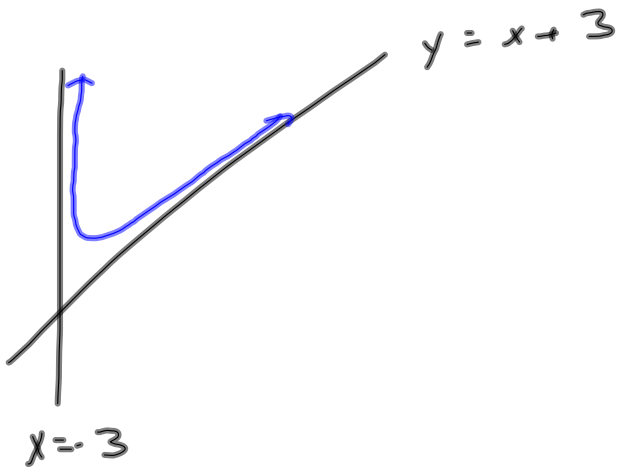
$x = \pm 2$

⑥ Hole or Slant

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

$$\begin{array}{r} x + 3 \\ x+3 \overline{)\, x^2 + 6x - 2} \\ -(x^2 + 3x) \\ \hline 3x - 2 \\ -(3x + 9) \\ \hline -11 \end{array}$$

Slant at $y = x + 3$



1-27-14

4th Trig

Asymptotes

Horizontal:

Bubo → y = 0

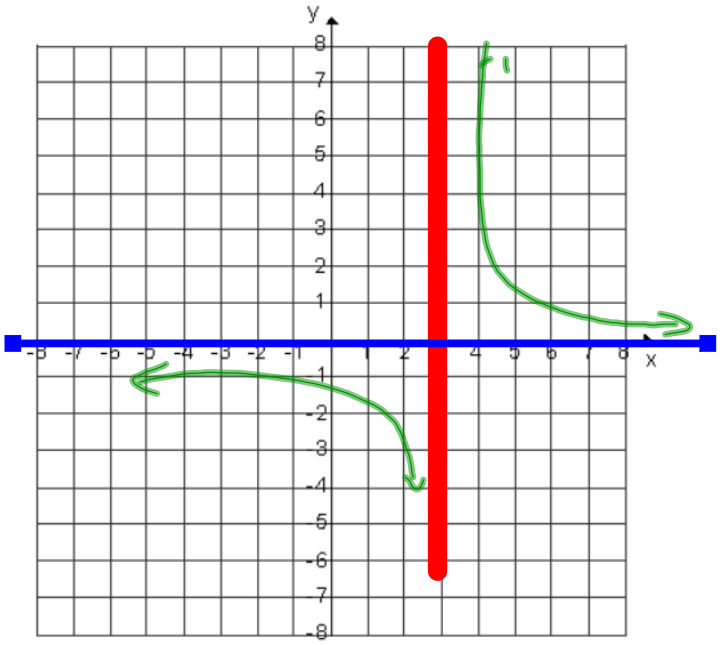
Both → None

Eats DC → ÷ coef.

Vertical: Found by what denominant can't be

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

Vertical Asymptote at X = 3



① $y = \dfrac{x^4 - 6x + 1}{x + 5}$

H: Both None

V: $x = -5$

② $y = \dfrac{x - 8}{x^2 - 4}$

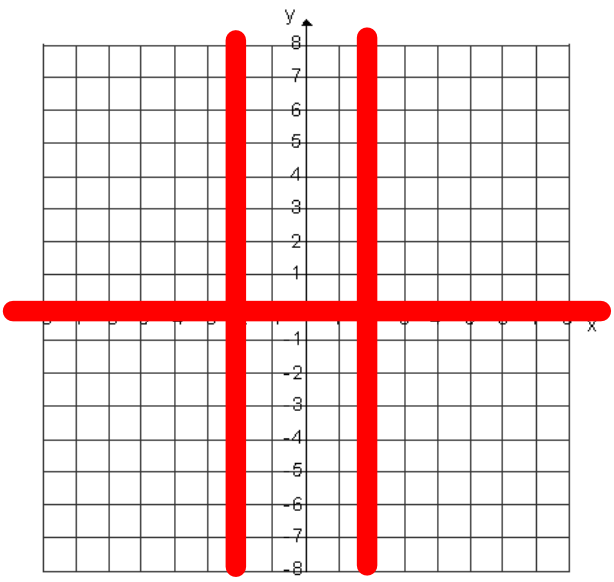
H: Bobo $y = 0$

V: $x^2 - 4 = 0$

$(x - 2)(x + 2) = 0$

$x \neq 2$ nor -2

$X = \pm 2$



(3) $y = \dfrac{4x^2+6}{2x^2-2x-1000}$

Just do Horizontal

H: Eats DC

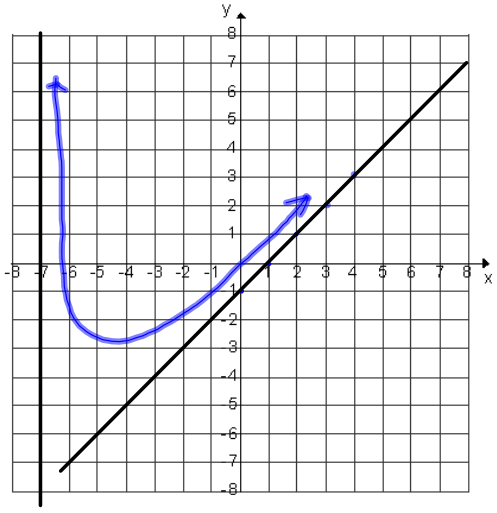
$y = \frac{4}{2} = 2$

Slant occurs when top is one degree larger than bottom.

(4) $y = \dfrac{x^2+6x+1}{x+7}$

$$
\begin{array}{r}
x-1 \\
x+7 \overline{)\,x^2+6x+1} \\
-x^2-7x \\
\hline
-x+1 \\
-x-7 \\
\hline
8
\end{array}
$$

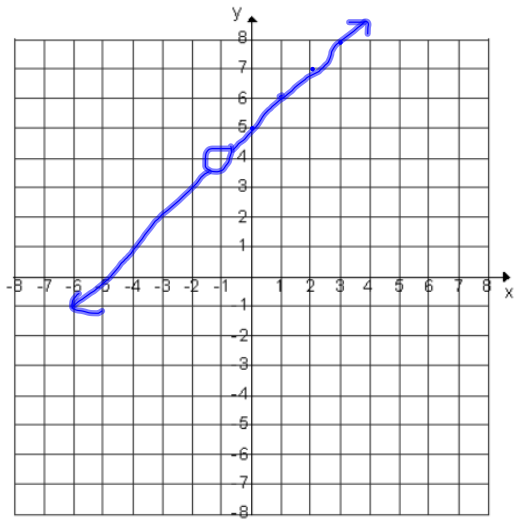
Slant at $y = x-1$



(5) $y = \dfrac{x^2 + 6x + 5}{x + 1}$

$y = \dfrac{(x+5)(x+1)}{x+1}$

$y = x + 5 \quad [x \neq -1]$



(6) $y = \dfrac{x^2 + 8x + 7}{x + 2}$

$y = \dfrac{(x+7)(x+1)}{x+2}$ ∴ no hole

$$x+2 \overline{)\, x^2 + 8x + 7}$$

$x + 6$

$-x^2 + 2x$

$6x + 7$

$6x + 12$

-5

Slant at

$y = x + 6$