

Limits @  $\infty$  or  $-\infty$

$$\textcircled{1} \quad \lim_{x \rightarrow \infty} \frac{3x}{\sqrt{4x^2-1}} = \frac{3}{2}$$

(Same degree on the  $x$ 's  
take coeff.)

$$\textcircled{2} \quad \lim_{x \rightarrow -\infty} \frac{2x}{3x-2} = \frac{2}{3}$$

$$\lim_{x \rightarrow -\infty} \frac{2x}{\sqrt{9x^2-2}} = \frac{2}{3}$$

$$\textcircled{3} \quad \lim_{x \rightarrow \infty} \frac{x^2}{3x^3+7} = 0$$

Find VA/HA or Slant

$$y = \frac{x^3 + 3x^2 - 4x + 1}{x - 4}$$

VA:  $x = 4$

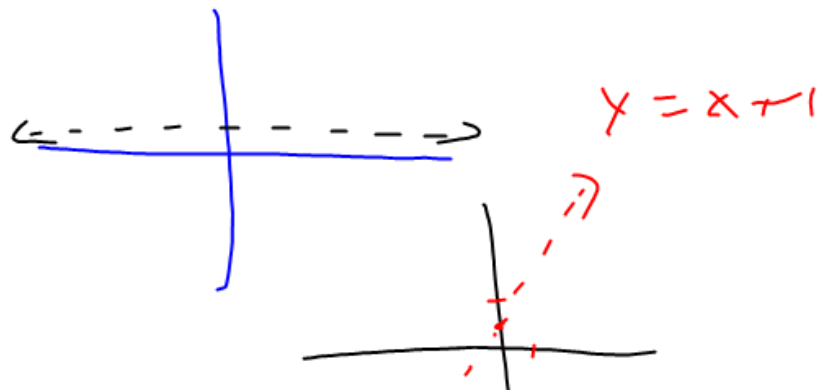
Y.int:  $(0, -\frac{1}{4})$

HA: none actual

Slant

$$y = x^2 + 7x + 24$$

$$\begin{array}{r} x^2 + 7x + 24 \\ x - 4 \overline{) x^3 + 3x^2 - 4x + 1} \\ \underline{-x^3 + 4x^2} \phantom{+ 1} \\ 7x^2 - 4x \phantom{+ 1} \\ \underline{-7x^2 + 28x} \phantom{+ 1} \\ 24x + 1 \end{array}$$



Graph


$$y = x^4 - 3x^3 + 5x^2 - 1$$

Y-int: (0, -1)

$$\textcircled{1} \quad y' = 4x^3 - 9x^2 + 10x \xrightarrow{\text{on Calc}} F_2, \text{ Solve}$$

$$= x(4x^2 - 9x + 10)$$

$$\text{Solve}(4x^2 - 9x + 10 = 0, x)$$

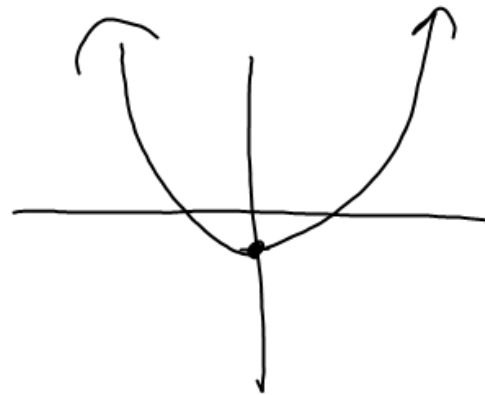
$x=0$   
  
 Rel min @ (0, -1)

$$\textcircled{2} \quad y'' = 12x^2 - 18x + 10$$

$$0 = 12x^2 - 18x + 10$$

False  
 No. P.O.I.

$$f''(x) > 0 \quad \text{or} \quad 0 \quad \text{or} \quad < 0$$



Graph

$$y = \frac{x^2 - 6x + 1}{x - 3}$$

$$VA: x=3$$

$$y' = \frac{8}{(x-3)^2} + 1$$

$$y' = \frac{x^2 - 6x + 17}{x^2 - 6x + 9}$$

$$C.P. x^2 - 6x + 17$$

Graph both: (the second one you can use your calculator to do the derivative!)

$$x^3 + 4x^2 + x - 6$$

$$\frac{2x^2}{x^2 - 16}$$

$$x^2 - 9x - 10 = 0$$

$$(x-10)(x+1)$$