

Graficas Pares

Pares

$$1) x^4 - 8x^2 + 3$$

$$\begin{array}{r|rrrrrr} -3 & 1 & 0 & -8 & 0 & 3 \\ & & -3 & 9 & -3 & 9 \\ \hline & 1 & -3 & 1 & -3 & \\ -1 & & -1 & 1 & 7 & -7 \\ \hline & 1 & -1 & 7 & 7 & \\ 1 & & 1 & 1 & & \\ \hline & 1 & 1 & -7 & 0 & \\ 3 & & 3 & 9 & & \\ \hline & 1 & 3 & 1 & & \end{array}$$

$$a_0 = \pm 1, \pm 3$$

$$a_n = \pm 1$$

$$\frac{1}{1}, \frac{3}{1}$$

$$-3, -1, 1, 3$$

$$U = x^2$$

$$U^2 - 8U + 3$$

$$x \frac{8 \pm \sqrt{64 - 4(3)(1)}}{2}$$

$$U_1 = 4 + \sqrt{13} = \frac{4 + \sqrt{13}}{1} = 2.75$$

$$U_2 = 4 - \sqrt{13} = \frac{4 - \sqrt{13}}{1} = .62$$

crises en x

$$\pm 2.75$$

$$\pm .62$$

$$f(0) = 0^4 - 8(0)^2 + 3 = 3 \quad (0, 3)$$

$$f'(x) = 4x^3 - 16x$$

$$x = 0$$

$$x = -2 \Rightarrow \text{Evaluar en segunda}$$

$$x = 2$$

Para encontrar los signos

$$f''(x) = 12x^2 - 16$$

Eval. Ptos Crit. en fun original

$$f'(0) = 0 - 16 = -16 \quad n$$

$$f(0) = 0^4 - 8(0)^2 + 3 = 3$$

$$f''(-2) = 12(-2)^2 - 16 = 32$$

$$f(-2) = 2^4 - 8(2)^2 + 3 = -13$$

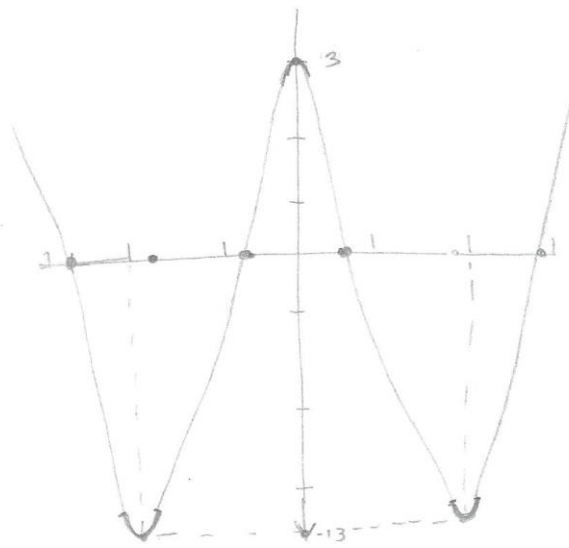
$$f''(2) = 12(2)^2 - 16 = 32$$

$$f(2) = 2^4 - 8(2)^2 + 3 = -13$$

$$0, 3 = n$$

$$-2, -13 \quad v$$

$$2, -13 \quad v$$



cortes en x

$$\pm 0.62$$

$$\pm 2.75$$

corte en y

$$(0, 3)$$

$$f(x) = 2x^6 + x^5 - 6x^4 + x^3 + 2x^2$$

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

$$x = 0$$

	2	1	-6	1	2
-2		-4	6	0	-2
	2	-3	0	1	0
		-1	2	-1	
-1/2	2	-4	2	0	
		2	-2		
1	2	-2	0		
		2			
1	2	0			

cortes en x

$$x_1 = -2$$

$$x_2 = -\frac{1}{2}$$

$$x_3 = 1$$

$$x_4 = 2$$

$$x = 0$$

Encontrar Corte en y

$$f(0) = 2(0) + 0^5 - 6(0) + 0 + 2(0) = 0 \quad (0, 0)$$

Encontrar Ptos Criticos

$$f'(x) = 12x^5 + 5x^4 - 24x^3 + 3x^2 + 4x$$

$$x(12x^4 + 5x^3 - 24x^2 + 3x + 4)$$

$$x_1 = 1$$

$$x_2 = 0$$

$$x_3 = -0.34$$

$$x_4 = -1.64$$

Evaluar en $f''(x)$

$$f''(x) = 60x^4 + 20x^3 - 72x^2 + 6x + 4$$

$$f''(1) = 18 > 0$$

$$f''(0) = 4 > 0$$

$$f''(-0.34) = -6.34 < 0$$

$$f''(-1.64) = 152.62 > 0$$

Evaluar los críticos en fun original.

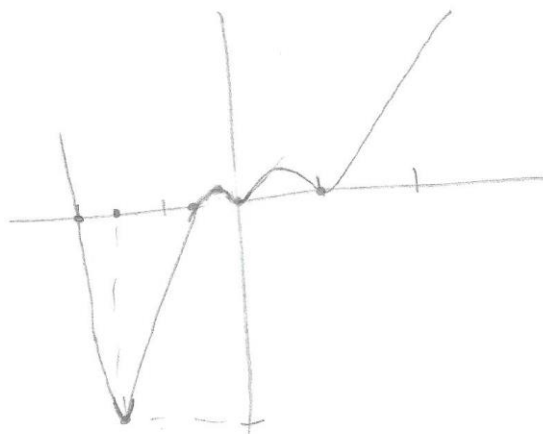
$$f(0) = 0$$

$$f(1) = 0$$

$$f(-0.34) = -1.1$$

$$f(-1.64) = -15.38$$

$$(0,0), (0,0), (-0.34, -1.1), (-1.64, -15.38)$$



$$f(x) = x^4 - x^2 - 240$$

$$\begin{array}{r|rrrrrr} & 1 & 0 & -1 & 0 & -240 & \\ -4 & & -4 & 16 & -60 & 240 & \\ \hline & 1 & -4 & 15 & -60 & 0 & \\ 4 & & 4 & 0 & 60 & & \\ \hline & 1 & 0 & 15 & 0 & & \end{array} \quad \begin{array}{l} x_1 = 4 \\ x_2 = -4 \end{array}$$

Corte en y

$$f(0) = 0^4 - 0^2 - 240 = -240$$

Puntos Críticos

$$f'(x) = 4x^3 - 2x = 2x(2x^2 - 1)$$

$$\begin{array}{l} 2x = 0 \\ x = 0 \end{array}$$

$$2x^2 - 1 = 0$$

$$x^2 = \frac{1}{2}$$

$$x = \pm \sqrt{\frac{1}{2}} = \pm \frac{\sqrt{2}}{2}$$

Evaluar en 2 derivada

$$\begin{aligned} f'' &= 12x^2 - 2 \\ &= 6x^2 - 1 \end{aligned}$$

$$f(0) = 6(0)^2 - 1 = -1 \quad \wedge$$

$$f\left(\frac{\sqrt{2}}{2}\right) = 6\left(\frac{\sqrt{2}}{2}\right)^2 - 1 = 3 - 1 = 2 \quad \vee$$

$$f\left(-\frac{\sqrt{2}}{2}\right) = 6\left(-\frac{\sqrt{2}}{2}\right)^2 - 1 = 3 - 1 = 2 \quad \wedge$$

Evaluar en fun original

$$f(0) = 0^4 - 0^2 - 240 = -240$$

$$= -240.25$$

$$f\left(\frac{\sqrt{2}}{2}\right) =$$

$$= -240.25$$

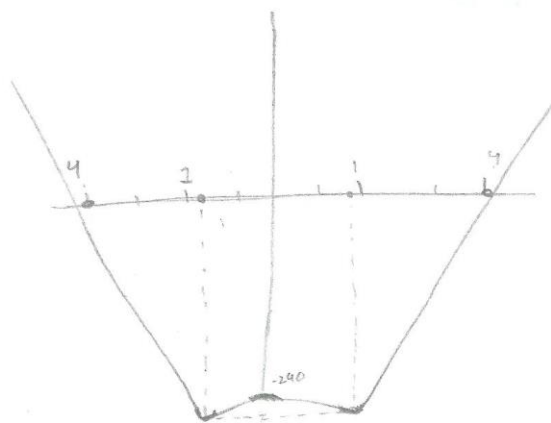
$$f\left(-\frac{\sqrt{2}}{2}\right) =$$

$$= -240.25$$

$$(0, -240) \quad \wedge$$

$$\left(\frac{\sqrt{2}}{2}, -240.25\right) \quad \vee$$

$$\left(-\frac{\sqrt{2}}{2}, -240.25\right) \quad \vee$$



Graficas impares

$$f(x) = x^3 - 5x^2 + 2x + 8$$

$$\begin{array}{r|rrrr} -1 & 1 & -5 & 2 & 8 \\ & & -1 & 6 & -8 \\ \hline & 1 & -6 & 8 & 0 \\ 2 & & 2 & -8 & \\ \hline & 1 & -4 & 0 & \\ 4 & & 4 & & \\ \hline & 1 & 0 & & \end{array} \quad \begin{array}{l} x_1 = -1 \\ x_2 = 2 \\ x_3 = 4 \end{array}$$

Conte en y

$$f(0) = 0^3 - 5(0)^2 + 2(0) + 8 = 8$$

Ptos Criticos

$$f'(x) = 3x^2 - 10x + 2$$

$$\frac{-10 \pm \sqrt{100 - 4(2)(3)}}{6} = \frac{5 \pm \sqrt{19}}{3} \approx 3.11$$

$$\frac{5 - \sqrt{19}}{3} \approx -0.2137$$

Evaluar en $f''(x)$

$$f''(x) = 6x - 10$$

$$f(3.11) = 6(3.11) - 10 = 8.66 \cup$$

$$f(-0.2137) = 6(-0.2137) - 10 = -8.71 \cap$$

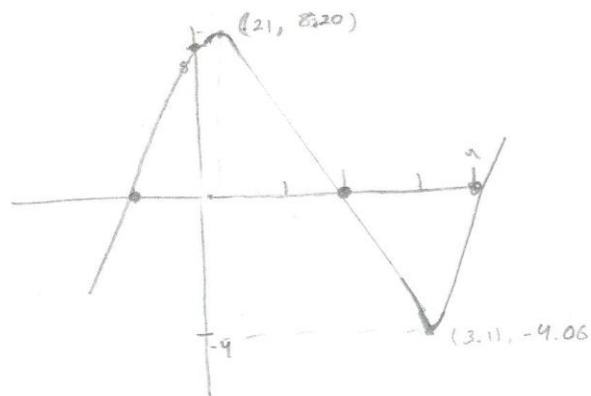
Evaluar en $f(x)$

$$f(3.11) = (3.11)^3 - 5(3.11)^2 + 2(3.11) + 8 = -4.06$$

$$f(-0.2137) =$$

$$= 8.20$$

$$(3.11, -4.06) \quad (-0.2137, 8.20)$$



$$f(x) = x^5 - 2x^4 + x^3$$

1	1	-2	1
1	1	-1	0
1	0		

$$x^3(x^2 - 2x + 1)$$

$$x^3 = 0$$

$$x_1 = 0$$

$$x_2 = 0$$

$$x_3 = 0$$

$$x_4 = 1$$

$$x_5 = 1$$

corte en y

$$f(0) = 0^5 - 2 \cdot 0^4 + 0^3 = 0$$

los criticos

$$f'(x) = 5x^4 - 8x^3 + 3x^2$$

$$x^2(5x^2 - 8x + 3)$$

3/5	5	-8	3
1	5	-5	0
	5	0	

$$x_1 = 0$$

$$x_2 = 0$$

$$x_3 = \frac{3}{5}$$

$$x_4 = 1$$

Sust Ptos Criticos en 2da derivada

$$f''(x) = 20x^3 - 24x^2 + 6x$$

$$f''(0) = 0$$

$$f''(1) = 20(1)^3 - 24(1)^2 + 6(1) = 2 \quad \cup$$

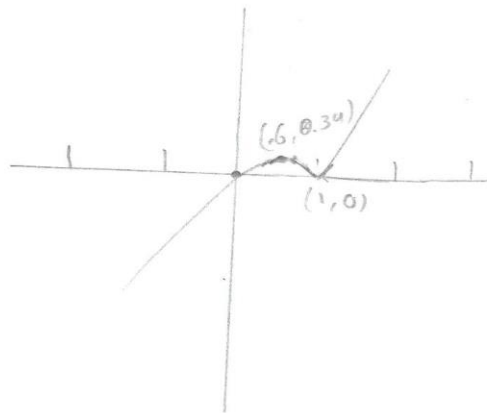
$$f''\left(\frac{3}{5}\right) = 20\left(\frac{3}{5}\right)^3 - 24\left(\frac{3}{5}\right)^2 + 6\left(\frac{3}{5}\right) = -\frac{18}{25} \quad \cap$$

Sust Ptos Criticos en fun original.

$$f(x) = 0^5 - 2(0)^4 + (0)^3 = 0 \quad (0, 0)$$

$$f\left(\frac{3}{5}\right) = \left(\frac{3}{5}\right)^5 - 2\left(\frac{3}{5}\right)^4 + \left(\frac{3}{5}\right)^3 = .03456 \quad \left(\frac{3}{5}, .034\right)$$

$$f(1) = (1)^5 - 2(1)^4 + (1)^3 = 0 \quad (1, 0)$$



$$F(x) = -2x^5 - 4x^4 + 22x^3 + 4x^2 - 72x$$

$$x(-2x^4 - 4x^3 + 22x^2 + 4x - 72)$$

$$x_1 = 0, x_2 = -3, x_3 = 2$$

Encontrar corte c/c y

$$f(0) = 0, (0,0)$$

Ptos críticos

$$f'(x) = -10x^4 - 16x^3 + 66x^2 + 48x - 72$$

$$x_1 = -3, x_2 = 2, x_3 = \frac{-3 + \sqrt{129}}{10}, x_4 = \frac{-3 - \sqrt{129}}{10}$$

Evaluar en 2 derivada

$$f''(x) = -40x^3 - 48x^2 + 132x + 48$$

$$f'(-3) = 300 \text{ n}$$

$$f'(2) = -200 \text{ u}$$

$$f'\left(\frac{-3 + \sqrt{129}}{10}\right) = 177 \text{ u}$$

$$f'\left(\frac{-3 - \sqrt{129}}{10}\right) = -198 \text{ n}$$

Evaluar en fun original.

$$f(-3) = 0$$

$$f(2) = 82.99$$

$$f(2) = 0$$

$$f\left(\frac{-3 + \sqrt{129}}{10}\right) = -33.33$$

$$-8.357 \quad - +$$

$$-1.435 \quad - -$$

