



UNIVERSIDAD AUTÓNOMA DEL ESTADO DE MÉXICO

**PREPARATORIA REGIONAL DE TEJUPILCO**

MATERIA: CÁLCULO INTEGRAL

CATEDRÁTICO: ALFONSO JARAMILLO AVILÉS

**PROBLEMAS DE DERIVADAS**

EQUIPO 2:

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QUINTO SEMESTRE GRUPO 1

TEJUPILCO, MÉXICO A 11 DE DICIEMBRE DE 2020

1.  $f(x) = \arcsin(2x+1)$

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

2.  $f(x) = \arccos(2x^2-3)$

$$y' = \frac{4x}{\sqrt{1-(2x^2-3)^2}}$$

3.  $f(x) = \arctan(x+3x^2)$

$$\frac{1+6x}{1+(x+3x^2)^2} \quad 1+6x$$

4.  $f(x) = \operatorname{arcsec}(3-x)$

$$\frac{-1}{(3-x)\sqrt{(3-x)^2-1}} \quad -1$$

5.  $f(x) = \frac{\sin x}{\arccos x^3}$

fa) =  $v \sin x \, dv$

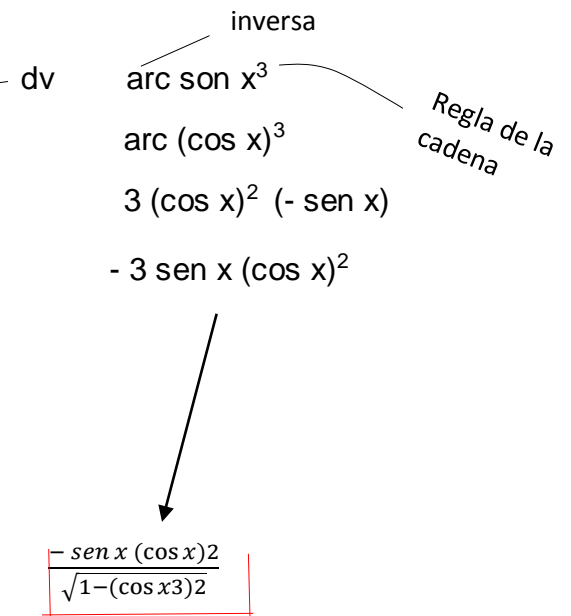
$v \arccos x^3 \, dv$

$$y_1 = (\arccos^3)(\cos x) - (\sin x)$$

$$y_1 = (\arccos^3)(\cos x) - (\sin x) \left( \frac{3 \sin x (\cos x)^3}{\sqrt{1-(\cos x^3)^2}} \right)$$

$$y_1 = \cos x \arccos x^3 + \frac{3 \sin x (\cos x)^2}{\sqrt{1-(\cos x^3)^2}}$$

$$(\arccos x^3)^2$$



$$1. f(x) = \frac{1}{3}x^3 + \frac{1}{2}x^2 - 6x + 8$$

$$y' = \frac{3}{3}x^2 + \frac{2}{2}x - 6 = 0$$

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

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

$$x+3=0 \quad x-2=0$$

$$\underline{x=-3} \quad \underline{x=2}$$

$$y'' = 2x$$

$(-3, -5)$  máximo  $1^\circ 2x+1$

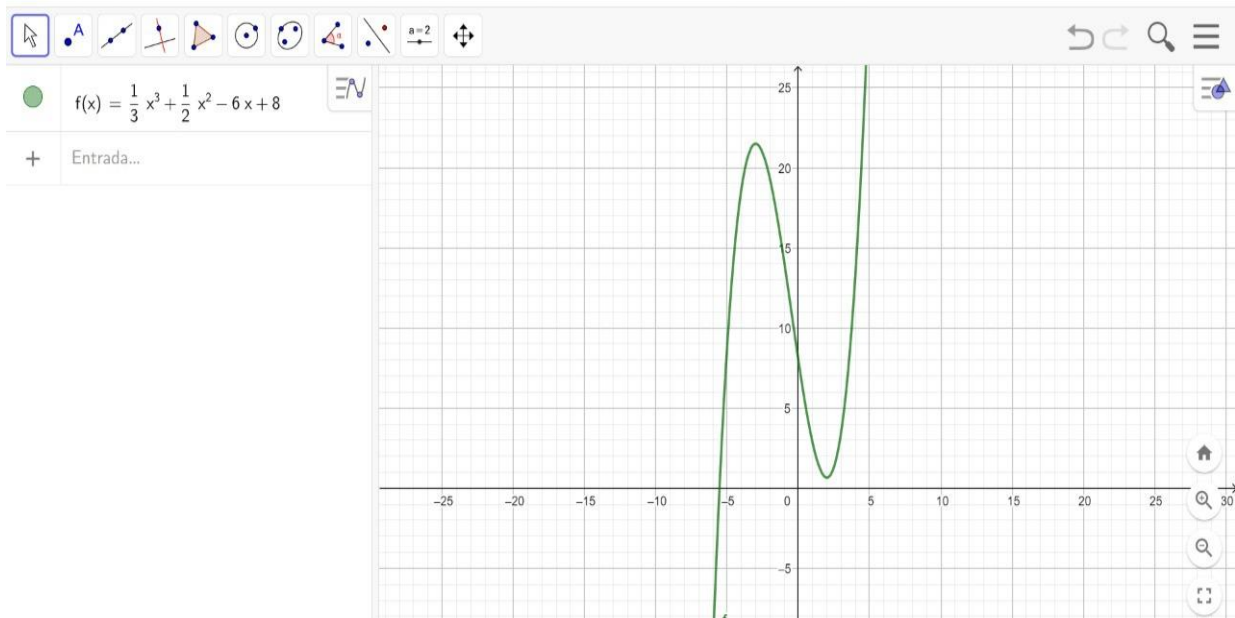
$$2(-3) + 1 = 5$$

$(2, 5)$  mínimo  $2^\circ 2x+1$

$$2(2) + 1 = 5$$

Crece  $(-\infty, -3]$  u  $(2, \infty)$

Decrece  $(-3, 2)$



$$2. f(x) = x^3 - 6x^2 + 9x - 8$$

$$y' = 3x^2 - 12x + 9$$

$$\frac{3x^2 - 12x + 9}{3}$$

$$x^2 - 4x + 3 = 0$$

$$(x - 3) \quad (x - 1)$$

$$x - 3 = 0 \quad x - 1 = 0$$

$$x = 3 \quad x = 1$$

$$y'' = 6x - 12$$

$$1^\circ 6(3) - 12 = 6 \quad \text{mínimo}$$

$$2^\circ 6(1) - 12 = -6 \quad \text{máximo}$$

Intervalo

$$1^\circ (3)^3 - 6(3)^2 + 9(3) - 8 = -8$$

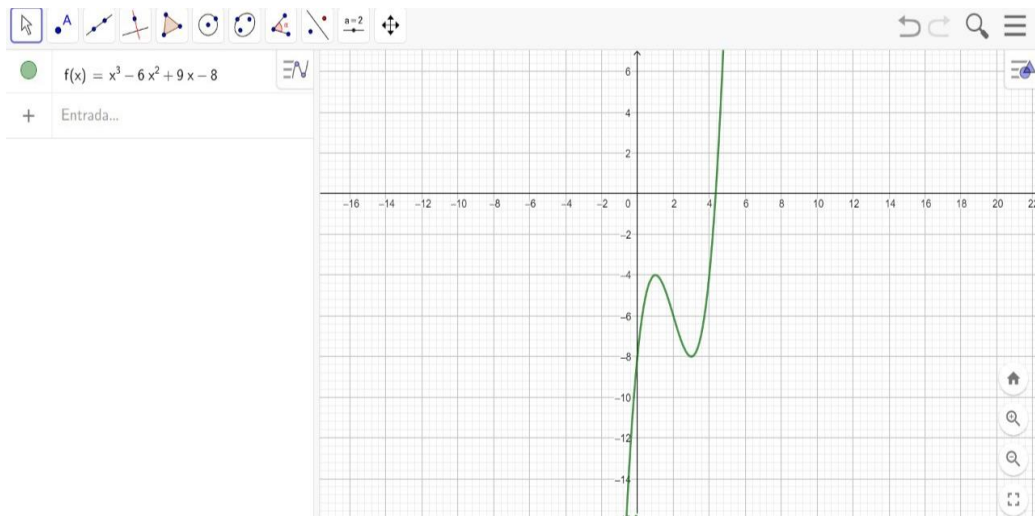
$$2^\circ (1)^3 - 6(1)^2 + 9(1) - 8 = -4$$

(3, -8) mínimo

(1, -4) máximo

Crece  $(-\infty, 1] \cup (3, \infty)$

Decrece (1,3)



$$3. f(x) = x^4 - 8x^2 + 16$$

$$y' = 4x^3 - 16x$$

$$4x(x^2 - 4) = 0$$

$$4x = 0$$

$$x = \frac{0}{4}$$

$$x = 0$$

$$x^2 - 4 = 0$$

$$x^2 = 4$$

$$\sqrt{x^2} = \sqrt{4}$$

$$x = \pm\sqrt{4}$$

$$x_1 = 2$$

$$x_2 = -2$$

$$x^4 - 8x^2 + 16$$

$$(2)^4 - 8(2)^2 + 16 = 0$$

$$(-2)^4 - 8(-2)^2 + 16 = 0$$

Decrece

$$(-\infty, -2] \cup (0, 2]$$

Crece

$$[-2, 0] \cup (2, \infty)$$

punto máximo

$$(0, 16)$$

punto mínimo

$$(-2, 0), (2, 0)$$

