

Clases Con El asistente MIYAKO

~~Miayko~~

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• $f(x) = x^5$
 $f'(x) = 5x^4$

• $f(x) = 3x^3$
 $f'(x) = 21x^6$

• $f(x) = x^2 + 5x$
 $f'(x) = 2x + 5$

• $f(x) = 4x^3 - x^1$
 $f'(x) = 12x^2 - 2x$

• $x^2 \cdot \operatorname{Sen}(x)$
 $2x \cdot \operatorname{Sen}(x) + (\operatorname{Cos}(x))(2x^2)$
 $2x \cdot \operatorname{Sen}(x) + 2x^2 \operatorname{Cos}(x)$

• $3x^2$
 $21x^6$

Regla de L'hopital

① $\lim_{x \rightarrow 1} \frac{\ln(x)}{x-1} = \frac{0}{0}$

$f(x) = \ln(x)$
 $f'(x) = \frac{1}{x}$

$f(x) = e^x$
 $f'(x) = ex$

$\lim_{x \rightarrow 1} \frac{\frac{1}{x}}{\frac{1}{1}} = \lim_{x \rightarrow 1} \frac{1}{x} = \frac{1}{1} = 1$

② $\lim_{x \rightarrow 0} \frac{\operatorname{Sen}(3x)}{x - \frac{3}{2} \operatorname{Sen}(2x)} = \frac{0}{0}$

$f(x) = \operatorname{Sen}(3x)$
 $f'(x) = 3 \cos(3x)$

$g(x) = x - \frac{3}{2} \operatorname{Sen}(2x)$

$g'(x) = 1 - \frac{3}{2} \cdot 2 \cos(2x)$

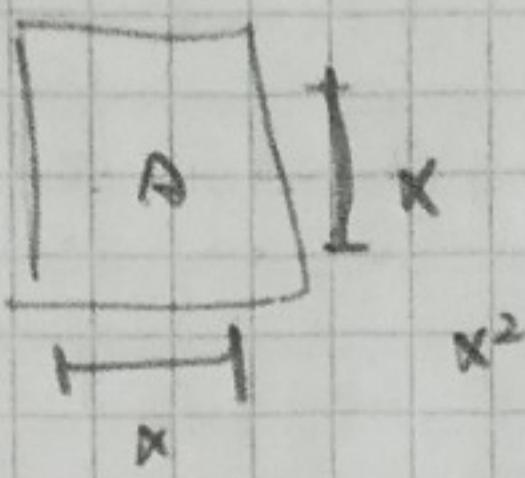
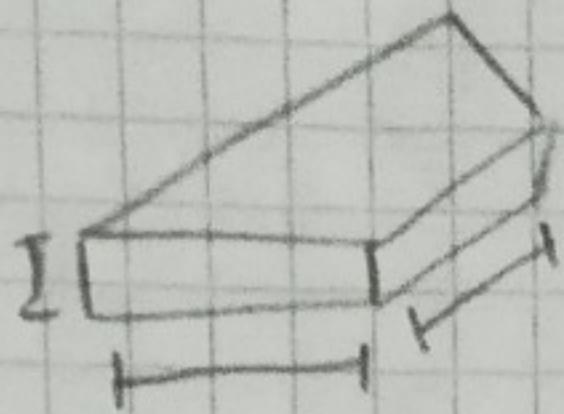
$g'(x) = 1 - 3 \cos(2x)$

$\lim_{x \rightarrow 0} \frac{3 \cos(3x)}{1 - 3 \cos(2x)}$

$\lim_{x \rightarrow 0} \frac{3 \cos(0)}{1 - 3 \cos(0)}$

$\lim_{x \rightarrow 0} \frac{3 \cdot 1}{1 - 3 \cdot 1} = \frac{3}{-2} = -\frac{3}{2}$

Capita



$$A = 2$$

$$V = 3$$

$$V = 252 \text{ m}^3$$

$$F = D = 5 \cdot x^2$$

$$T = D = 2,5 \cdot x$$

$$L = D = 3,5 \cdot 4 \cdot xy$$

$$= y \cdot x \cdot x = V = x^2 \cdot y$$

$$f(x) = 3 \cdot x^2 + 2,5x^2 + 14 \cdot y$$

$$f(x) = 7,5x^2 + 14 \cdot \left(\frac{252}{x^2}\right)$$

$$f(x) = 7,5x^2 + \frac{3528}{x^2}$$

$$f'(x) = 15x + \frac{3528}{x^2}$$

$$f'(x) = -\frac{3528}{x^2} + 15x = 0$$

$$\frac{-3528}{x^2} = -15x$$

$$-3528 = -15x \cdot x^2$$

$$-3528 = -15x^3$$

$$x^3 = -\frac{3528}{-15} = \frac{3528}{15}$$

$$x^3 = \frac{1176}{5}$$

$$\sqrt[3]{x^2} = \sqrt[3]{\frac{1176}{5}}$$

$$x = 6,17$$

$$f(x) = 7,5x^2 - \frac{3528}{x}$$

$$f(6,17) = 7,5(6,17)^2 - \frac{3528}{6,17}$$

$$f(6,17) = 2455,51 + 571,79$$

$$F(6,17) = 857,3 \text{ m}$$

$$y = \frac{252}{x^2}$$

$$y = \frac{252}{(6,17)^2}$$

$$y = 6,61 \text{ m}$$

Resuelto

$$\textcircled{1} \quad f(x) = -x^2$$

$$f'(x) = 0$$

$$f''(x) = -2$$

$$\textcircled{2}) \quad -2x = 0$$

$$x = 0$$

$$x = 0$$

$$x = 0$$

$$C = (0, 0)$$

$f''(x) = 0 \rightarrow P. \text{ inflexión}$

$f''(x) > 0 \rightarrow P. \text{ Min} \rightarrow +$

$f''(x) < 0 \rightarrow P. \text{ Máx} \rightarrow -$

$$\textcircled{3}) \quad f''(x) = -2$$

$$f''(0) = -2 \rightarrow \text{Mín}$$

$$\textcircled{2} \quad f(x) = 2x^3 - 4x^2$$

$$f'(x) = 6x^2 - 8x$$

$$f''(x) = 12x - 8$$

$$\textcircled{1}) \quad 6x^2 - 8x = 0$$

$$x(6x - 8) = 0$$

$$x = 0$$

$$6x - 8 = 0$$

$$6x = 8$$

$$x = \frac{8}{6} = \frac{4}{3}$$

$$x = 0 \quad x_2 = \frac{4}{3}$$

$$P_1(0, 0) \quad P_2\left(\frac{4}{3}, -\frac{64}{27}\right)$$

$$\textcircled{2} \quad f(x) = 2x^3 - 4x^2$$

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

$$f(0) = 0$$

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

$$f\left(\frac{4}{3}\right) = 2\left(\frac{4}{3}\right)^3 - 4\left(\frac{4}{3}\right)^2$$

$$f\left(\frac{4}{3}\right) = 2\left(\frac{64}{27}\right) - 4\left(\frac{16}{9}\right)$$

$$\begin{cases} f''(x) = 12x - 8 \\ f''(0) = 12(0) - 8 \\ f''(0) = 0 - 8 = -8 \text{ M\'ax} \end{cases}$$

$$\begin{cases} f''(x) = 12x - 8 \\ f''\left(\frac{4}{3}\right) = 12\left(\frac{4}{3}\right) - 8 \\ f''\left(\frac{4}{3}\right) = 48 - 8 = 16 - 8 = 8 \text{ min} \end{cases}$$

$$F\left(\frac{4}{3}\right) = \frac{128}{27} - \frac{64}{9}$$

$$F\left(\frac{4}{3}\right) = -\frac{64}{27}$$

$$\textcircled{1} \quad \frac{5}{3} \cdot \frac{4}{5} - \left(\frac{2}{3} \cdot \frac{2}{7} \right) - \left(\frac{4}{3} \cdot \frac{5}{7} \right) = \frac{20}{21} - \frac{12}{21} = \frac{8}{21} \text{ m}$$

$$\textcircled{2} \quad \frac{1}{2} + \frac{3}{4} = \left(\frac{1}{2} \cdot \frac{3}{4} \right) + \left(\frac{3}{4} \cdot \frac{1}{2} \right) = \frac{3}{8} + \frac{3}{8} = \frac{18}{8} = \frac{2}{4} \text{ m}$$

$$\textcircled{3} \quad \frac{3}{2} - \frac{2}{3} + \frac{2}{5} = \left(\frac{3}{2} \cdot \frac{15}{15} \right) - \left(\frac{2}{3} \cdot \frac{10}{10} \right) + \left(\frac{2}{5} \cdot \frac{6}{6} \right) = \frac{45}{30} - \frac{20}{30} + \frac{12}{30} = \frac{27}{30} = \frac{9}{10} \text{ m}$$

$$\textcircled{4} \quad \frac{20}{21} + \frac{1}{2} = \left(\frac{20}{21} \cdot \frac{1}{2} \right) + \left(\frac{1}{2} \cdot \frac{9}{9} \right) = \frac{20}{42} + \frac{9}{18} = \frac{40}{42} = \frac{20}{21} \text{ m}$$

$$\textcircled{5} \quad \frac{3}{4} + \frac{1}{3} - \frac{10}{21} = \left(\frac{3}{4} \cdot \frac{15}{15} \right) + \left(\frac{1}{3} \cdot \frac{21}{21} \right) - \left(\frac{10}{21} \cdot \frac{15}{15} \right) = \frac{45}{60} + \frac{21}{60} - \frac{150}{60} = -\frac{284}{60} = -\frac{142}{30} = -\frac{71}{15} \text{ m}$$