"CALCULO DIFERENCIAL "REFUERZO" 19/03/2025

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FECHA: 19/03/2025
CURSO: TELEMATICA "A" 1ER SEMESTRE

Siempre la derivada de una constante es 0

- REGLA DE LA POTENCIA.

Si $F(x) = x^n$; entonces $F'(x) = n \cdot x^{n-1}$

Ejm: DERIVA $F(x) = x^5$
$F'(x) = 5x^4$

Ejm 2: DERIVA $F(x) = 3x^7$
$F'(x) = 21x^6$

- REGLA DE LA CONSTANTE.

SI $F(x) = C$, donde C es una constante, entonces $F'(x) = 0$

Ejm1: DERIVA $F(x) = 7$
$F'(x) = 0$

Ejm 2: DERIVA $F(x) = -3$
$F'(x) = 0$

- REGLA DE LA SUMA.

Si $F(x) = g(x) + h(x)$; entonces $F'(x) = g'(x) + h'(x)$

Ejm1: DERIVA $F(x) = x^2 \cdot \sin(x)$
$F'(x) = 2x \cdot \sin(x) + x^2 \cdot \cos(x)$

- REGLA DEL PRODUCTO.

Si $F(x) = g(x) \cdot h(x)$; entonces $F'(x) = g'(x) \cdot h(x) + g(x) \cdot h'(x)$

Ejm1: DERIVA $F(x) = x^2 \cdot \sin(x)$
$F'(x) = 2x \cdot \sin(x) + x^2 \cdot \cos(x)$

Ejm2 = DERIVA $F(x) = (2x+1) \cdot e^x$
$F'(x) = 2 \cdot e^x + (2x+1) \cdot e^x$
$F'(x) = 2e^x + 2xe^x + 1e^x$
$F'(x) = 3e^x$

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"REFUERZO"

MAXIMOS Y MINIMOS

EJERCICIOS

1) F' y F''

- $F'(x) = -2x$ -> ? "C" = 0
- $F''(x) = -2$

2) $F'(x) = 0$ -> $C = (X, Y)$ -> $C = (0,0)$ -> MAX R//

$-2 \cdot x = 0$

$x = \frac{0}{-2}$

$x = 0$

$F(0) = (0)^2$

$F(0) = 0$

$Y = 0$

3) $F''(x) = 0$ -> P.I = 0

$F''(x) > 0$ -> P. mín = +

$F''(x) < 0$ -> P. MÁX = −

$f''(x) = -2$

$F''(0) = -2$: 0

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

1) $F'(x) = 6x^2 - 8x$

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

Aux

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

2) $F'(x) = 0$ -> ? = "C" ->

$6x^2 - 8x = 0$

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

$6x - 8 = 0$

$6x = +8$

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

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

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

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

$F''(c) = 12x - 8$

$F''\left(\frac{4}{3}\right) = 12\left(\frac{4}{3}\right) - 8$

$F''\left(\frac{4}{3}\right) = \frac{12}{1} \cdot \frac{4}{3} = 8$

$F''\left(\frac{4}{3}\right) = 16 - 8 = 8$ min

$\frac{128}{27} - \frac{64}{9}$

REGLA DE 3

$\frac{128}{27} - \frac{64}{9} \cdot \frac{3}{3}$

$\frac{128}{27} - \frac{192}{27} = -\frac{64}{27}$

$1 = \frac{4}{4}$

$1 = \frac{8}{8}$

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

$\frac{1}{4} + \frac{1}{4} = \frac{2}{4}$

$\frac{1}{4} = \frac{2}{8}$

$\frac{1}{8} + \frac{1}{4} \rightarrow \frac{1}{8} + \frac{1}{4} \cdot \frac{1}{2} = \frac{1}{8} + \frac{2}{8} = \frac{3}{8}$

$\frac{4}{4}$ $\frac{8}{8}$

$\frac{1}{4} \cdot \frac{2}{2} = \frac{2}{8}$

$\frac{2}{8}$

TAREA "REFUERZO" 20/03/2025

① $\frac{5}{3} - \frac{4}{7} = \frac{35}{21} - \frac{12}{21} = \frac{23}{21}$

② $\frac{1}{2} + \frac{3}{4} = \frac{2}{4} + \frac{3}{4} = \frac{5}{4}$

③ $\frac{20}{9} + \frac{1}{2} = \frac{40}{18} + \frac{9}{18} = \frac{49}{18}$

4) $\frac{3}{7} + \frac{1}{5} - \frac{10}{3} = \frac{45}{105}, \frac{21}{105}, \frac{350}{105}$

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HÔPITAL.

$\lim_{x\to 0}\left[\frac{0}{0}\right]$ $F(x)=\frac{\ln x}{x-1}\Big/\frac{\infty}{\infty}$ $\lim_{x\to 1}$

$F(x)=\ln(x)$ $\quad g(x)=x-1$

$F'(x)=\frac{1}{x}$ $\quad g'(x)=1$

$\lim_{x\to 1}\frac{F(x)}{g'(x)}=\frac{\frac{1}{1}}{\frac{1}{1}}=\frac{1}{x}$

$\lim_{x\to 1}\frac{1}{x}$

$\lim_{x\to 1}\frac{1}{(1)}=1$ I

$F(x)=e^x$

$F'(x)=e^x$ ley

$F(x)=\operatorname{sen}(3x)$ $\quad \lim_{x\to 0}\frac{\operatorname{sen}(3x)}{x-\frac{3}{2}\operatorname{sen}(2x)}=\frac{0}{0}$

$F'(x)=3.\cos(3x)$

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

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

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

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

$\lim_{x\to 0}\frac{3\cos(3.0)}{1-3\cos(2.0)}$

$\lim_{x\to 0}\frac{3.1}{1-3.1}=\frac{3}{-2}=\boxed{-\frac{3}{2}}$

$\ln(x)\to\frac{1}{x}$

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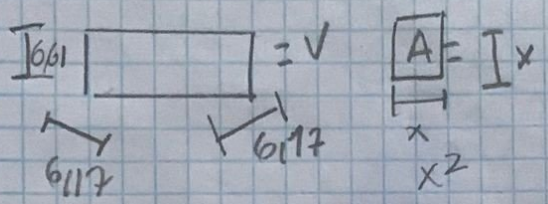

A = 2 | Ax
V = 3 | x² · y = 252

y = 252 / x²

V 252 m³ = y · x · x = V = x² · y

F □ = 5 · x²

T □ = 2,5 · x²

L = □ = 3,5 · 4 · xy

F(x) = 5 · x² + 2,5 x² + 14 x y

F(x) = 7,5x² + 14 * (252 / x²) (-1)

F(x) = 7,5x² + 3528 / x

F'(x) = 15x + (-3528 / x²)

F'(x) = - 3528 / x² + 15x

- 3528 / x² + 15x = 0

- 3528 / x² = - 15x

- 3528 = - 15x · x²

- 3528 = - 15 x³

x³ = + 3528 / + 15

x³ = + 1176 / 5

∛x³ = ∛(1176/5)

x = 6,17

F(x) = y

F(x) = 7,5 x² + 3528 / x

F(6,17) = 7,5(6,17)² + (3528 / 6,17)

F(6,17) = 285,51 + 571,74

F(6,17) = $ 857,3

Aux

b(x) = 3528 / x¹

b(x) = 3528 · x^(-1-1)

b'(x) = 3528 · (-1) · x^-2

b'(x) = - 3528 · x^-2

b'(x) = - 3528 / x²

y = 252 / x²

y = 252 / (6,17)²

y = 661