

⇒ las Derivadas ⇐

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¿Una Curva tiene Pendiente?

Sacar la tangente

Formula

$$m_1 = \lim_{h \rightarrow 0} \frac{f(x_0 + h) - f(x_0)}{h}$$

Si $h = \Delta x$

$$m_t = \lim_{\Delta x \rightarrow 0} \frac{f(x_0 + \Delta x) - f(x_0)}{\Delta x}$$

$$\text{⊕} = X$$

$$\rightarrow a + b^2 = a^2 + 2ab + b^2$$

Cuadrado Perfecto → fórmula

Ejercicios

$$(a+b)^2 = a^2 + 2ab + b^2$$

$$\lim_{h \rightarrow 0} f(x+h) - f(x)$$

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

$$f(x+h) = 4(x+h)^2 + (x+h) + 3$$

$$= 4(x^2 + 2xh + h^2) + (x+h) + 3$$

$$f(x+h) = 4x^2 + 8xh + 4h^2 + x + h + 3$$

$$\lim_{h \rightarrow 0} \frac{4x^2 + 8xh + 4h^2 + x + h + 3 - 4x^2 - x - 3}{h}$$

$$\frac{8xh + 4h^2 + h}{h} = h(8x + 4h + 1)$$

$$\lim_{h \rightarrow 0} = 8x + 4h + 1 = 8x + 1$$

$$8x + 4(0) + 1 = 8x + 1$$

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

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

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

$$f_{,m} = \frac{2x^2 + 4xh + 2h^2 - 3x - 3h + 5 - 2x^2 + 3x - 5}{h}$$

$$f_{,m} = \frac{4xh + 2h^2 - 3h}{h}$$

$h=0$

$$f_{,m} = \frac{h(4x + 2h - 3)}{h}$$

$h=0$

$$f_{,m} = 4x + 2h - 3 = 4x + 2(0) - 3 = 4x - 3$$

$h=0$

$$f(x) = 3x + 5$$

$$f(x) = 3x + 5$$

$$f(x+h) = 3(x+h) + 5$$

$$\frac{3(x+h) + 5 - 3x - 5}{h}$$

$$\frac{3x + 3h + 5 - 3x - 5}{h}$$

$$\frac{3h}{h} = 3$$

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

$$f(x+h) = 2(x+h) - 4$$

$$\frac{2x + 2h - 4 - 2x + 4}{h}$$

$$\frac{2h}{h} = 2$$

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

$$f(x+h) = 5(x+h)^2 + 3(x+h) + 5$$

$$5(x^2 + 2xh + h^2) + 3x + 3h + 5$$

$$5x^2 + 10xh + 5h^2 + 3x + 3h + 5$$

$$\frac{5x^2 + 10xh + 5h^2 + 3x + 3h + 5 - 5x^2 - 3x - 5}{h}$$

$$\frac{10xh + 5h^2 + 3h}{h} = \frac{h(10x + 5h + 3)}{h}$$

$$10x + 5h + 3 = 10x + 5(0) + 3 = 10x + 3$$

$$f(x) = 2x^2 + 5x + 10$$

$$f(x+h) = 2(x+h)^2 + 5(x+h) + 10$$

$$2(x^2 + 2xh + h^2) + 5x + 5h + 10$$

$$2x^2 + 4xh + 2h^2 + 5x + 5h + 10$$

$$\frac{2x^2 + 4xh + 2h^2 + 5x + 5h + 10 - 2x^2 - 5x - 10}{h}$$

$$\frac{4xh + 2h^2 + 5h}{h} = \frac{h(4x + 2h + 5)}{h} = 4x + 2h + 5 = 4x + 5 = 2h$$

$$(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$$

$$f(x) = 2x^3 + 2x^2 + 3x + 2$$

$$f(x+h) = 2(x+h)^3 + 2(x+h)^2 + 3(x+h) + 2$$

$$f(x+h) = 2(x^3 + 3x^2h + 3xh^2 + h^3) + 2(x^2 + 2xh + h^2) + 3x + 3h + 2$$

$$f(x+h) = 2x^3 + 6x^2h + 6xh^2 + 2h^3 + 2x^2 + 4xh + 2h^2 + 3x + 3h + 2$$

$$\frac{6x^2h + 6xh^2 + 2h^3 + 4xh + 2h^2 + 3h}{h}$$

$$h = (6x^2 + 6xh + 2h^2 + 4x + 2h + 3) = \frac{6x^2 + 6xh + 2h^2}{4x + 2h + 3}$$

$$6x^2 + 6x(0) + 2(0)^2 + 4x + 2(0) + 3$$

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