Punto 1

* $f'(x) = \dfrac{-f(x+2h) + 4f(x+h) - 3f(x)}{2h}$

$\rightarrow x^2$

$$f'(x^2) = \lim_{h\to 0} \frac{\cancel{-x^2} + 4xh - \cancel{4h^2} + \cancel{4x^2} + 8xh + \cancel{4h^2} - \cancel{3x^2}}{2h}$$

$$f'(x^2) = \lim_{h\to 0} \frac{4x\cancel{h}}{2\cancel{h}} = 2x$$

$\rightarrow \sin x$

$$f'(\sin x) = \lim_{h\to 0} \frac{-\sin(x+2h) + 4\sin(x+h) - 3\sin(x)}{2h}$$

$$= \lim_{h\to 0} \frac{-\sin(x)\cos(2h) - \cos(x)\sin(2h) + 4\sin(x)\cos(h) + 4\cos(x)(\sin(h) - 3\sin x}{2h}$$

$$= \operatorname{sen}(x) \lim_{h\to 0} \frac{(-\cos(2h) + 4\cos(h) - 3)}{2h} + \cos(x) \lim_{h\to 0} \frac{(-\sin(2h) + 4\sin(h))}{2h}$$

$$= \operatorname{Sen}(x) \lim_{h\to 0} \frac{2\operatorname{sen}(2h) - 4\operatorname{sen}(h)}{2} + \cos(x) \lim_{h\to 0} \frac{-2\cos(2h) + 4\cos(h)}{2}$$

$$= \operatorname{sen}(x)(0) + \cos(x)\left(\frac{-2+4}{2}\right) = \cos(x)$$

* $f''(x) = \dfrac{f(x+h) - 2f(x) + f(x-h)}{h^2}$

$\rightarrow \sin(x)$

$$f''(x^2) = \lim_{h\to 0} \frac{\operatorname{sen}(x+h) - 2\operatorname{sen}(x) + \operatorname{sen}(x-h)}{h^2}$$

$$f''(x^2) = \lim_{h\to 0} \frac{\operatorname{sen}(x)\cos(h) + \cancel{\operatorname{sen}(h)\cos(x)} - 2\operatorname{sen}(x) + \operatorname{sen}(x)\cos(h) - \cancel{\operatorname{sen}(h)\cos(x)}}{h^2}$$