The Rules of Differentiation

① Take the derivative using the differentiation rules

$$y = 6 \implies \frac{df}{dx} = 0 \qquad\qquad y = 3x^2 \implies \frac{df}{dx} = 6x$$

$$y = x^3 - 2x^2 - 1 \implies \frac{df}{dx} = 3x^2 - 4x$$

$$y = x^4 + 5x \implies 4x^3 + 5 \qquad\qquad y = x^8 \implies \frac{df}{dx} = 8x^7$$

$$y = ax^n - 1 \implies \frac{df}{dx} = nax^{n-1}$$

$$y = (x-3)^3 \implies \text{chamemos } g(f(x)) \text{ de } (x-3)^3 \text{ e } (x-3) = f(x)$$

então, pela <u>regra da cadeia</u>, $\dfrac{dg(f(x))}{dx} = \left((x-3)^3 \right)' \cdot (x-3)'$

$$\implies \frac{dg(f(x))}{dx} = 3(x-3)^2 \cdot 1 = 3(x-3)^2$$