

ACTIVIDAD 1 DE DERIVADAS

RELACIONA CADA UNA DE LAS SIGUIENTES FUNCIONES CON SU RESPECTIVO PROCEDIMIENTO Y DERIVADA CORRECTOS

$$y = x^2$$

$$y = \sqrt{x-2}$$

$$\begin{aligned} \frac{dy}{dx} &= \lim_{\Delta x \rightarrow 0} \frac{\sqrt{x+\Delta x-2} - \sqrt{x-2}}{\Delta x} \\ \frac{dy}{dx} &= \lim_{\Delta x \rightarrow 0} \frac{\sqrt{x+\Delta x-2} - \sqrt{x-2}}{\Delta x} \left(\frac{\sqrt{x+\Delta x-2} + \sqrt{x-2}}{\sqrt{x+\Delta x-2} + \sqrt{x-2}} \right) \\ \frac{dy}{dx} &= \lim_{\Delta x \rightarrow 0} \frac{(\sqrt{x+\Delta x-2})^2 + \sqrt{x-2}\sqrt{x+\Delta x-2} - \sqrt{x-2}\sqrt{x+\Delta x-2} - (\sqrt{x-2})^2}{\Delta x(\sqrt{x+\Delta x-2} + \sqrt{x-2})} \\ \frac{dy}{dx} &= \lim_{\Delta x \rightarrow 0} \frac{x + \Delta x - 2 - x + 2}{\Delta x(\sqrt{x+\Delta x-2} + \sqrt{x-2})} \\ \frac{dy}{dx} &= \lim_{\Delta x \rightarrow 0} \frac{\Delta x}{\Delta x(\sqrt{x+\Delta x-2} + \sqrt{x-2})} \\ \frac{dy}{dx} &= \lim_{\Delta x \rightarrow 0} \frac{1}{\sqrt{x+\Delta x-2} + \sqrt{x-2}} \\ \frac{dy}{dx} &= \frac{1}{(\sqrt{x+0-2} + \sqrt{x-2})} \\ \frac{dy}{dx} &= \frac{1}{(\sqrt{x-2})^2} \end{aligned}$$

$$\begin{aligned} \frac{dy}{dx} &= \lim_{\Delta x \rightarrow 0} \frac{2(x+\Delta x)+1 - (2x+1)}{\Delta x} \\ \frac{dy}{dx} &= \lim_{\Delta x \rightarrow 0} \frac{2x+2\Delta x+1 - 2x-1}{\Delta x} \\ \frac{dy}{dx} &= \lim_{\Delta x \rightarrow 0} \frac{2\Delta x}{\Delta x} \\ \frac{dy}{dx} &= \lim_{\Delta x \rightarrow 0} 2 \\ \frac{dy}{dx} &= 2 \end{aligned}$$

$$f(x) = 2x + 1$$

$$\begin{aligned} \frac{dy}{dx} &= \lim_{\Delta x \rightarrow 0} \frac{(x+\Delta x)^2 - x^2}{\Delta x} \\ \frac{dy}{dx} &= \lim_{\Delta x \rightarrow 0} \frac{x^2 + 2x\Delta x + \Delta x^2 - x^2}{\Delta x} \\ \frac{dy}{dx} &= \lim_{\Delta x \rightarrow 0} \frac{2x\Delta x + \Delta x^2}{\Delta x} \\ \frac{dy}{dx} &= \lim_{\Delta x \rightarrow 0} \frac{\Delta x(2x + \Delta x)}{\Delta x} \\ \frac{dy}{dx} &= \lim_{\Delta x \rightarrow 0} 2x + \Delta x \end{aligned}$$