

differentiate $\frac{1-x^2}{1+x^2}$

$$u = 1 - x^2$$

$$v = 1 + x^2$$

$$y = \frac{u}{v}$$

$$\frac{du}{dx} = -2x$$

$$\frac{dv}{dx} = 2x$$

$$\frac{dy}{dx} = \frac{v \frac{du}{dx} - u \frac{dv}{dx}}{v^2}$$

$$= \frac{(1+x^2) \cdot (-2x) - (1-x^2) \cdot 2x}{(1+x^2)^2}$$

$$= \frac{-(2x + 2x^3) - (2x - 2x^3)}{(1+x^2)^2}$$

$$= \frac{-2x - 2x^3 - 2x + 2x^3}{(1+x^2)^2}$$

$$\frac{dy}{dx} = -\frac{4x}{(1+x^2)^2}$$