PRINT NAME: SOLUTIONS

Calculus I [1823–001] Quiz I

Friday, October 13, 2000

Q1]... Compute the derivatives of the following functions.

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

  Using the quotient rule we get

$$\begin{aligned} f'(x) &= \frac{\frac{d(1-x^2)}{dx}(1+x^2) - \frac{d(1+x^2)}{dx}(1-x^2)}{(1+x^2)^2} \\ &= \frac{(-2x)(1+x^2) - (2x)(1-x^2)}{(1+x^2)^2} \\ &= \frac{-4x}{(1+x^2)^2} \end{aligned}$$

- $g(x) = x^\pi$

  By the power rule we have (simply)

$$g'(x) = \pi x^{\pi-1}$$

- $h(x) = 1 - \frac{x}{1-\sqrt{x}}$

  By the sum and quotient ad power rules we get

$$\begin{aligned} h'(x) &= 0 - \frac{\frac{dx}{dx}(1-\sqrt{x}) - (x)\frac{d(1-\sqrt{x})}{dx}}{(1-\sqrt{x})^2} \\ &= -\frac{1-\sqrt{x} - x(-\frac{1}{2\sqrt{x}})}{(1-\sqrt{x})^2} \\ &= -\frac{1-\sqrt{x}+\frac{\sqrt{x}}{2}}{(1-\sqrt{x})^2} \\ &= \frac{\sqrt{x}-2}{2(1-\sqrt{x})^2} \end{aligned}$$