MATH 2200
QUIZ 7

Name: Key

Problem: Let $y = (x^2+1)^{x^2}$. Find $\dfrac{dy}{dx}$.

Solution: Logarithmic differentiation.

$$\ln y = \ln\left((x^2+1)^{x^2}\right) = x^2 \ln(x^2+1)$$

$$\frac{1}{y}\frac{dy}{dx} = 2x\ln(x^2+1) + x^2\frac{1}{x^2+1}2x$$

$$\frac{dy}{dx} = y\left(2x\ln(x^2+1) + \frac{2x^3}{x^2+1}\right) = (x^2+1)^{x^2}\left(2x\ln(x^2+1) + \frac{2x^3}{x^2+1}\right).$$

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