

WRITE YOUR NAME:

MAC 2311 Quiz 3
Wednesday March 22nd

Question 1. Find dy/dx using any correct method.

$$y = x^{\sin x}$$
$$\ln y = \ln(x^{\sin x}) = \sin x \cdot \ln x$$

$$\frac{d}{dx}(\ln y) = \frac{d}{dx}(\sin x \cdot \ln x)$$

$$\frac{1}{y} \cdot \frac{dy}{dx} = (\sin x)' \cdot \ln x + \sin x \cdot (\ln x)'$$

$$\frac{1}{y} \cdot \frac{dy}{dx} = \cos x \cdot \ln x + \sin x \cdot \frac{1}{x}$$

$$\frac{dy}{dx} = y \cdot \left(\cos x \cdot \ln x + \frac{\sin x}{x} \right)$$

$$\text{or } \frac{dy}{dx} = x^{\sin x} \cdot \left(\cos x \cdot \ln x + \frac{\sin x}{x} \right)$$