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Find the derivative using the log function

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

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

$$x^y \frac{1}{x} + \frac{1}{y} \frac{dy}{dx} = \frac{dy}{dx}$$

$$\ln x = \frac{dy}{dx} - \frac{1}{y} \frac{dy}{dx}$$

$$y \ln x = \frac{dy}{dx} - \frac{1}{y} \frac{dy}{dx}$$

$$y = \frac{dy}{dx} - \frac{1}{y} \frac{dy}{dx}$$

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