Ex

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

$$y' = \frac{1}{2}\left(x+\sqrt{x+\sqrt{x}}\right)^{-1/2} \cdot \left(x+\sqrt{x+\sqrt{x}}\right)'$$

$$\left(x+\sqrt{x+\sqrt{x}}\right)' = 1 + \frac{1}{2}\left(x+\sqrt{x}\right)^{-1/2} \cdot \left(x+\sqrt{x}\right)'$$

$$= 1 + \frac{1}{2\sqrt{x+\sqrt{x}}}\left(1+\frac{1}{2\sqrt{x}}\right)$$

$$y' = \frac{1}{2\sqrt{x+\sqrt{x+\sqrt{x}}}}\left(1+\frac{1}{2\sqrt{x+\sqrt{x}}}\left(1+\frac{1}{2\sqrt{x}}\right)\right)$$

$e^{x^{x^x}} \neq e^{x^3}$

x^x

e^{x^x}

$y' = (x^x)' = ?$

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$$y = x^x$$

$$\ln y = \ln x^x = x \ln x$$

$$\frac{1}{y} \cdot y' = 1 \cdot \ln x + x \cdot \frac{1}{x} = \ln x + 1$$

$$y' = (\ln x + 1) y = (\ln x + 1) x^x$$

$$y = e^{x^x}$$

$$\ln y = \ln e^{x^x} = x^x$$

$$\ln(\ln y) = \ln x^x = x \ln x$$

$$\frac{1}{\ln y} \cdot \frac{1}{y} y' = \ln x + 1$$

$$y' = (\ln x + 1) y \ln y = (\ln x + 1) e^{x^x} \cdot x^x$$

$$y = e^{x \cdot x} - exe$$