S6.3 II #4 Find the inverse

$f(x) = y = (\ln(x))^4$

$x = (\ln(y))^4 = x$ Solve for y

4^{th} power implies $x \geq 0$

$\sqrt[4]{(\ln(y))^4} = \sqrt[4]{x}$ so $\sqrt[4]{x}$ is real.

$e^{\ln(y)} = e^{\sqrt[4]{x}}$ means $y = e^{\sqrt[4]{x}}$

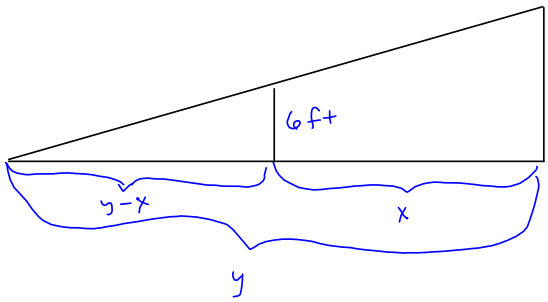
I prefer

$y = e^{\sqrt[4]{x}}$

Give a shout! I'm lurking, nearby! I'll probably do a related rates example, from Chapter 2, to help with the comprehensive (Chapters 1 - 4) part of the Final.

This is one like #15 in the Related-Rates section. I think it's 2.7, 2.8 or 2.9. Checking... Yeah. 2.8 #15 from the 8th Edition.

15. A street light is mounted at the top of a 15-ft-tall pole. A man 6 ft tall walks away from the pole with a speed of 5 ft/s along a straight path. How fast is the tip of his shadow moving when he is 40 ft from the pole?



GIVEN $\frac{dx}{dt} = x' = 5 \frac{ft}{s}$

WANT $\frac{dy}{dt}\Big|_{x=40\,ft}$

"Similar triangles thing going on here..."

$$\frac{15}{y} = \frac{6}{y-x} \Rightarrow$$

$$\Rightarrow 15(y-x) = 6y$$

$$15y - 15x = 6y$$

$$9y = 15x$$

$$\frac{d}{dt}\left[y = \frac{15}{9}x = \frac{5}{3}x \right]$$

$$\frac{dy}{dt} = \frac{5}{3}\frac{dx}{dt} = \frac{5}{3}\cdot 5 = \frac{25}{3}\,ft/s = \frac{dy}{dt}$$

Note $\frac{dy}{dt}$ is a constant!

#minimum.