MAT 121 4.4 #17

I think it's great to see the pattern/relationship between logarithmic and exponential form. But I really want you to see an equation like this:

$\log_9(729) = 3$

and see your way to the related, equivalent, exponential equation, by taking 9 to the power of both sides. Huh? I want you to see how these guys are inverse functions of one another and hammer at the skills for equation-solving, yet to come.

$9^{\log_9(729)} = 9^3$

The line above implies

$729 = 9^3$

In the sequel, the first thing you should think of to find x in this equation

$3^x = 77$

is

$\log_3(3^x) = \log_3(7)$, which is, of course, just

$x = \log_3(x)$.

The log extracts the *x* from the e**x**ponent, *because logs and exponentials are inverse functions*! Don't *ever* lose sight of that, just because the book has a cool, formulaic way of solving the equation, quickly.

Still, you probably want to do a *little* of that jazz, just to cement in your mind that $\log_3(729)$ is saying "What power of 3 does it take to get 729, i.e., $729 = 3^?$. Log says "Show me your power!"