Calculus 3.7 Number 22

The key to this problem is using the Chain Rule and Formula number 3 on page 246.

$$\frac{d}{dx}(lnlnlnx)$$

start there and assign"lnlnx" the letter u

so then the problem looks like this:

$$\frac{d}{dx}(ln(u))$$

which, as the formula says, is equal to

$$\frac{1}{u}\frac{du}{dx}$$

So what you have is 1/u (d/dx (u) all over again, except this time your "u" is going to be "lnlnx"

So we keep the 1/u and sort of set him to the side for a second.

Then we do this:

$$\frac{d}{dx}(lnlnx)$$

just like last time, we start by assigning "lnx" to be "u_2",

so we get

$$\frac{d}{dx}(lnu_2)$$

which is

$$\frac{1}{u_2}\frac{du}{dx}$$

so for the last time, we repeat these steps again
this time simply differentiating lnx, which is 1/x

So all total we have

$$(\frac{1}{lnlnx})(\frac{1}{lnx})(\frac{1}{x})$$

Since we can't simply this any further, this entire expression is the solution.