

So, there's the chain rule when taking derivatives:

$$\frac{d}{dx} f(g(x)) = f'(g(x)) g'(x)$$

And inverse functions do this:

$$f(g(x)) = x$$

So for derivatives of inverse functions:

$$\begin{aligned} \frac{d}{dx} f(g(x)) &= \frac{d}{dx} x \\ f'(g(x)) g'(x) &= 1 \end{aligned}$$

And usually what you need for problems is this:

$$g'(x) = \frac{1}{f'(g(x))}$$

Remember though -  
this is only the case if  
functions  $f$  and  $g$  are  
INVERSES of each other.