

MATH 236: Calculus II
Exercise C
due Thursday, September 20

- (1) From the previous exercise, $\ln x$ is a 1:1 function, and therefore has an inverse function. We now name this function. Let

$$EXP(x) = \ln^{-1}(x)$$

In other words, for all appropriate values of x and y , $EXP(y) = x$ if and only if $y = \ln x$.

- (2) What are the domain and range of EXP ?
- (3) Find and quote a theorem or theorems from Calculus I that guarantees that \ln as defined in the Exercises is continuous everywhere it is defined. (There is more than one way to do this.)

- (4) Find and quote a theorem from Chapter 7 that guarantees that EXP is continuous everywhere it is defined.

- (5) Recall that if f is invertible, $f(x_0) = y_0$ and $f'(x_0)$ exists and is not equal to zero, then

$$(f^{-1})'(y_0) = \frac{1}{f'(x_0)}$$

Apply this fact to derive a formula for $EXP'(x)$ for all $x \in \text{dom}(EXP)$