

Problem 1

1. Rewrite a^x such that the base is in terms of e . (i.e. write it as $e^{f(x)}$ for some function f).
2. Differentiate this expression to show that the derivative of a^x is $\ln a \cdot a^x$.

Problem 2

1. Fill in the blank $\tan(\tan^{-1}(x)) = \cdot$
2. Find the derivative of $\tan^{-1}(x)$.
3. Using the chain rule, find the derivative of $\tan^{-1}(xe^x)$.