CALCULUS JOURNAL
DERIVATIVES OF SPECIAL FUNCTIONS

1. a) Implicit differentiation must be used when _____

_____ or when _____.

   b) If you are finding $\frac{dh}{dm}$ using implicit differentiation in a relation which contains the variables h, k,

   m, and p, the variable which should be treated as "normal" is _____ while $\frac{d?}{d\_\_}$ should be added

   when _____.

2. (a) The domain of $f(x) = \ln x$ is _____. To find the domain of the natural log of a quantity,

   you must _____.

   (b) To find the derivative of a $\log_b x$ function, you must first_____

   _____.

3. Write a set of steps for finding the derivative of a variable raised to a variable power.

4. a) Expressions such as $\frac{0}{0}$ or $\frac{\infty}{\infty}$ are considered to be _____ because

   _____.

   b) Why are expressions such as $0 \cdot \infty$ or 1^∞ considered indeterminate? _____

   _____.

   c) L'Hopital's Rule can only be used when the indeterminate forms _____ or _____ are present.

   d) If L'Hopital's Rule is applied to a function and the new function also results in an indeterminate

   form, you should _____.

   e) The limit of a function that results in $0 \cdot \infty$ or $\infty - \infty$ is found by first _____

   _____.

   f) The limit of a function which results in an expression such as 0^0, ∞^0, or 1^∞ must be found by

   _____.

5. Important Rules, Formulas, Etc.

   a) Change of base formula for logarithms

b) $\dfrac{d}{dx} \ln x$

c) $\dfrac{d}{dx} e^x$

d) $\dfrac{d}{dx} a^x$

e) Derivatives of the 6 inverse trig functions

f) $\lim\limits_{x \to +\infty} e^x =$ _____ $\lim\limits_{x \to -\infty} e^x =$ _____ $\lim\limits_{x \to +\infty} \ln x =$ _____ $\lim\limits_{x \to 0^+} \ln x =$ _____