Calc 1 Discussion Questions: Week 4

Summer 2021

1. (3.1-3.3) Consider the exponential rule: $e^{x+y} = e^x e^y$. Show how this is equivalent to the logarithm rule $\ln(a \cdot b) = \ln a + \ln b$
2. (3.1-3.3) Consider the exponential rule $e^{kx} = (e^x)^k$. Show how this is equivalent to the logarithm rule $\ln a^r = r \ln a$.
3. (3.1-3.3) The expression $y = f^{-1}(x)$ means $f(y) = x$. Use implicit differentiation to find an expression for $\frac{dy}{dx}$ in terms of $f'(x)$.
4. (3.6) Show how the derivatives of the hyperbolic functions are found.
5. (3.6) Show how the derivatives of the inverse hyperbolic functions are found.
6. (3.7) Evaluate the limits: $\lim_{x \to 0^+} x^x$ and $\lim_{x \to \infty} x^{1/x}$.