SECTION 2.7: INTEGRALS, EXPONENTIAL FUNCTIONS AND LOGARITHMS

1. List things you know about the function $f(x) = \ln(x)$.

2. A new definition for the natural logarithm.

3. Explain/justify how the facts below follow immediately from this definition.

   (a) $\ln(1) = 0$.

   (b) If $0 < x < 1$, then $\ln(x) < 0$.

   (c) The domain of $f(x) = \ln(x)$ is restricted to positive x-values.

   (d) The graph of $f(x) = \ln(x)$ keeps growing but is grows at a slower and slower rate.

   (e) $\frac{d}{dx}(\ln(x)) = \frac{1}{x}$.

4. Another way to discover logarithm rules.

5. Another view of the number e and the function $g(x) = e^x$.

6. Use this definition (and rules about logarithms) to confirm the rule $e^p e^q = e^{p+q}$.

7. Use the fact that $N = e^{\ln(N)}$ provided $N > 0$, to find the derivative of $y = a^x$ for $a > 0$.