Statistics Bootcamp
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Exponents and Logarithm Practice

Exponent Properties:	**Logarithm Properties:**
1. $a^x a^y = a^{x+y}$	1. $\log_a(xy) = \log_a(x) + \log_a(y)$
2. $a^{-x} = \frac{1}{a^x}$	2. $\log_a(x^y) = y \log_a(x)$
3. $a^{xy} = (a^x)^y$	3. $\log_a(x)$ when $x \leq 0$ is undefined
4. $a^0 = 1$	

1. Sketch the general shape of the following functions:

   $y = \ln(x)$

   $y = e^x$

2. Rewrite the logarithmic equations as equivalent exponential equations:

   $\log_a(b) = c$

   $\log(x) = 4$

3. Rewrite the exponential equations as equivalent logarithmic equations:

   $x^y = z$

   $e^x = 3$

4. Solve for x:

   $\log_x(81) = 4$

   $\log_{\frac{1}{6}}(x) = 2$

5. Evaluate without a calculator:

   $\log(10000000)$

   $\log(1)$

6. Exponentiate the following expressions, then simplify:

   $x + 4$

   $x + 2y$

   $3x - 2y + z$

7. Rewrite these expressions as a single logarithm:

   $\log(5) + \log(x)$

   $2\ln(y) + \ln(x) - \ln(3)$