Review of logarithms

- We will discuss here natural logarithms, which are most commonly used in science.
- We will denote the logarithm of a number a as $log(a)$, although you may also see $log_e(a)$ or $ln(a)$.
- The logarithm of a is the number to which you have to raise e in order to get a.
- So if $a = e^b$ then $b = log(a)$.
- The symbol e is a mathematical constant approximately equal to 2.718.
- The exponential and logarithmic functions are inverses, so $log(e^b) = b$ and $e^{log(a)} = a$.
- Here are some useful properties of natural logarithms
    1. $log(1) = 0$
    2. $log(c) < 0$ for $c < 1$
    3. $log(c) > 0$ for $c > 1$
    4. $log(e) = 1$

5. $log(c^d) = dlog(c)$
6. $log(cd) = log(c) + log(d)$
7. $log(c/d) = log(c) - log(d)$

- Base ten (or common) logarithms and natural logarithms are related as

$$log_e(a) = 2.303 log_{10}(a)$$