Chapter 1-Math Review

Sets:

- $\mathbb{Z} = \{\ldots, -3, -2, -1, 0, 1, 2, 3, \ldots\}$ is the integers.

- $\mathbb{N} = \{0, 1, 2, 3, \ldots\}$ is the non-negative integers, also known as the natural numbers.

- $\mathbb{Z}^+ = \{1, 2, 3, \ldots\}$ is the positive integers.

- $\mathbb{R}$ is the real numbers

- $\mathbb{Q}$ is the rational numbers

- $\mathbb{C}$ is the complex numbers

Infinity is not a number.

handy rules for manipulating exponents:

$$
\begin{aligned}
b^x b^y &= b^{x+y} \\
a^x b^x &= (ab)^x \\
(b^x)^y &= b^{xy} \\
b^{(x^y)} &\neq (b^x)^y
\end{aligned}
$$

Useful facts about logarithms include:

$$
\begin{aligned}
b^{\log_b(x)} &= x \\
\log_b(xy) &= \log_b x + \log_b y \\
\log_b(x^y) &= y \log_b x \\
\log_b x &= \log_a x \log_b a
\end{aligned}
$$