Laws of Exponents

$$a^{-1} = \frac{1}{a}$$

$$a^{-n} = \frac{1}{a^n}, a \neq 0$$

$$a^{m+n} = a^m \cdot a^n$$

$$a^{m-n} = \frac{a^m}{a^n}, a \neq 0$$

$$(a \cdot b)^n = a^n \cdot b^n$$

$$\left(\frac{a}{b}\right)^n = \frac{a^n}{b^n}, b \neq 0$$

$$(-1)^{2n} = 1$$

$$(-1)^{2n+1} = (-1)$$

$$a^{1/2} = \sqrt{a}$$

$$a^{1/n} = \sqrt[n]{a}$$

$$a^{m/n} = \sqrt[n]{a^m}$$

$$\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$$

$$\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}, b \neq 0$$

$$\sqrt[n]{a^n} = |a|, \quad 2 \mid a$$

$$\sqrt[n]{a^n} = a, \quad a \text{ is odd}$$

$$\sqrt[n]{\sqrt[m]{a}} = \sqrt[nm]{a}$$

Laws of Logarithm

$$\log A + \log B = \log AB$$

$$\log A^n = n \log A$$

$$\log A - \log B = \log \frac{A}{B}$$

Changing from base c to b:

$$\log_c A = \frac{\log_b A}{\log_b c}$$

Careful with the following (Note: not equal sign ' ≠ ' being used):

$$\log(A + B) \neq \log A + \log B$$

$$\log\left(\frac{a}{b}\right) \neq \frac{\log(a)}{\log(b)}$$

$$[\log(a)]^n \neq n \log(a)$$