

Exponential Properties:

(a ≠ 0 and b ≠ 0)

$$b^0 = 1$$

$$b^1 = b$$

$$b^m b^n = b^{m+n}$$

$$(b^m)^n = b^{m \cdot n}$$

$$\frac{b^m}{b^n} = b^{m-n} = \frac{1}{b^{n-m}}$$

$$b^{-n} = \frac{1}{b^n}$$

$$(ab)^n = a^n b^n$$

$$b^{\frac{1}{n}} = \sqrt[n]{b}$$

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

$$\left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n$$

$$b^{\frac{m}{n}} = \left(\sqrt[n]{b}\right)^m = \sqrt[n]{b^m}$$

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

$$\sqrt[m]{\sqrt[n]{b}} = \sqrt[n]{\sqrt[m]{b}} = \sqrt[m \cdot n]{b}$$

$$\sqrt[n]{b^n} = \begin{cases} |b| & \text{if } n \text{ is even} \\ b & \text{if } n \text{ is odd} \end{cases}$$

Doubling Time

Half – Life Time

$$Q = Q_0 \cdot 2^{t/T_{double}}$$

$$Q = Q_0 \cdot \left(\frac{1}{2}\right)^{t/T_{half}}$$