Some Basic Formulas

$$i_n = \frac{a(n) - a(n-1)}{a(n-1)} \qquad d_n = \frac{a(n) - a(n-1)}{a(n)}$$

$$v = \frac{1}{1+i}$$

Simple $a(t) = 1 + it$

Compound $a(t) = (1+i)^t$

$$(1+i)^t = \left(1 + \frac{i^{(m)}}{m}\right)^{mt} \qquad a(t) \cdot d(t) = 1$$

When rates of interest and discount are equivalent:

$$i = \frac{d}{1-d} \qquad d = \frac{i}{1+i} = iv = 1 - v$$

Force of Interest:

$$\delta_t = \frac{a'(t)}{a(t)} \qquad a(t) = e^{\int_0^t s_r dr}$$

Constant Force of interest δ:

$$a(t) = e^{\delta t} \qquad \delta = \ln(1+i)$$

δ: nominal rate subject to continuous compounding

i: annual effective rate

$$ax^2 + bx + c = 0 \qquad \text{Solve for } x$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$