If a is the **accuracy** and m the **maximum hit**, then the expected number of hits to kill an opponent with h hitpoints is

$$\langle L' \rangle = \frac{1}{a} \sum_{k=0}^{\left\lfloor \frac{h-1}{m+1} \right\rfloor} \left(\frac{m+1}{m}\right)^{h-mk} \left(\frac{-1}{m+1}\right)^{k} \binom{h-mk-1}{k} \tag{1}$$

assuming that the opponent does not regenerate. For $h \gg m$ equation 1 has the asymptotic form

$$\langle L' \rangle \sim \frac{2}{am}\left(h + \frac{m-1}{3}\right) \tag{2}$$

If the opponent regenerates every T_R ticks and is hit every T_A ticks, then the expected number of hits to kill and the expected number of hitpoints regenerated are

$$\langle L \rangle \approx \frac{1}{1 - \frac{T_A}{T_R}\frac{2}{am}}\left(\langle L' \rangle - \frac{T_A}{T_R}\frac{2(m+1)}{(am)^2}\right) \tag{3}$$

$$\langle R \rangle \approx \frac{T_A}{T_R}\left(\langle L \rangle - \frac{m+1}{am}\right) \tag{4}$$

respectively. The exact values of $\langle L \rangle$ and $\langle R \rangle$ can be obtained as solutions to linear systems of h equations.

The kill rate and damage rate are

$$v_k = \frac{1}{T_A \langle L \rangle} \quad \text{and} \quad v_d = \frac{h + \langle R \rangle}{T_A \langle L \rangle} \tag{5}$$

respectively. In particular, if T_A is given in seconds, v_d is the DPS.