令E(x) 為有x顆頭的揮劍次數期望值，則

$E(5) = 10 + 0.8\times E(5) + 0.2\times E(4)$

$E(4) = \frac{10}{3} + 0.8\times E(5) + 0.2\times E(3)$

$E(3) = \frac{10}{5} + 0.8\times E(4) + 0.2\times E(2)$

$E(2) = \frac{10}{7} + 0.8\times E(3) + 0.2\times E(1)$

$E(1) = \frac{10}{9}$

整理過後，

$E(5) = 50 + E(4)$

$E(4) = \frac{650}{3} + E(3) = \frac{290320}{63}$

$E(3) = \frac{2630}{3} + E(2)$

$E(2) = \frac{221440}{63}$

$E(1) = \frac{10}{9}$

$ANS = \frac{290320}{63}$