$v_0 = 0$

$v \to \alpha v - \varepsilon g$

$v_1 = \alpha v_0 - \varepsilon g$

$v_1 = -\varepsilon g$

$v_2 = \alpha v_1 - \varepsilon g$

$= -\alpha \varepsilon g - \varepsilon g = -\varepsilon g (1+\alpha)$

$v_3 = \alpha v_2 - \varepsilon g$

$= -\varepsilon g (1+\alpha)\alpha - \varepsilon g$

$= -\varepsilon g (\alpha + \alpha^2 + 1)$

$v_n = -\varepsilon g (1 + \alpha + \alpha^2 + \cdots \alpha^{n-1})$

$= \frac{-\varepsilon g}{1-\alpha}$

$g_0 = g_1 = g_2 \cdots \cdots = g$

$\varepsilon \|g\|_3$

$\frac{\varepsilon \|g\|_3}{(1-\alpha)}$

$\alpha = 0.9$

$\frac{\varepsilon \|g\|_3}{1-0.1}$ $= \frac{\varepsilon \|g\|_3}{0.1}$