If temporal term is discretized with three-time-level method, we get

$$\frac{V}{2\Delta t}(3q^{n+1} - 4q^n + q^{n-1}) = -\sum R(q^{n+1}). \tag{1}$$

$$\frac{V}{2\Delta t}(3q^{n+1} - 4q^n + q^{n-1}) + \frac{V}{2\Delta t}q^n = -\sum R(q^{n+1}) + \frac{V}{2\Delta t}q^n. \tag{2}$$

$$\frac{3V}{2\Delta t}(q^{n+1} - q^n) + \frac{V}{2\Delta t}q^{n-1} = -\sum R(q^{n+1}) + \frac{V}{2\Delta t}q^n. \tag{3}$$

$$\frac{3V}{2\Delta t}(q^{n+1} - q^n) = -\sum R(q^{n+1}) + \frac{V}{2\Delta t}(q^n - q^{n-1}). \tag{4}$$

$$\frac{3V}{2\Delta t}\Delta q = -\sum R(q^{n+1}) + \frac{V}{2\Delta t}(q^n - q^{n-1}). \tag{5}$$