Position, Velocity, & Acceleration Formulas

Position

$$\Delta \mathbf{r} = \mathbf{r_f} - \mathbf{r_i}$$

Velocity

Average Velocity:
$$\mathbf{v}_{avg} = \frac{\Delta \mathbf{r}}{\Delta t}$$

Instantaneous Velocity:
$$\mathbf{a} = \lim_{\Delta t \to 0} \frac{\Delta \mathbf{v}}{\Delta t} = \frac{d\mathbf{v}}{dt}$$

Acceleration

Average Acceleration :
$$\mathbf{a}_{\mathrm{avg}} = \frac{\Delta \mathbf{v}}{\Delta t}$$

Instantaneous Acceleration :
$$\mathbf{a} = \lim_{\Delta t \to 0} \frac{\Delta \mathbf{v}}{\Delta t} = \frac{d\mathbf{v}}{dt}$$