Symbol	Formula(s)	Interpretation / Name
$\vec{r}$	$\langle x, y, z \rangle$	position vector
$\lvert\vec{r}\rvert$	$\sqrt{\vec{r}\cdot\vec{r}} = \sqrt{x^2+y^2+z^2}$	distance to origin $(0,0,0)$
$\vec{v}$	$d\vec{r}/dt$	velocity
$\lvert\vec{v}\rvert$	$\sqrt{\vec{v}\cdot\vec{v}}$	speed; magnitude of velocity
$\vec{T}$	$\vec{v}/\lvert\vec{v}\rvert$	unit tangent vector; direction of motion
$\vec{a}$	$d\vec{v}/dt$	acceleration
$d\lvert\vec{v}\rvert/dt$	$\frac{d}{dt}\sqrt{\vec{v}\cdot\vec{v}} = \vec{T}\cdot\vec{a}$	rate of change of speed
$\vec{a}_{\parallel}$	$\text{proj}_{\vec{v}}\vec{a} = (\vec{T}\cdot\vec{a})\vec{T}$	parallel part of acceleration, which causes speed changes
$\vec{a}_{\perp}$	$\text{orth}_{\vec{v}}\vec{a} = \vec{a} - \vec{a}_{\parallel}$	perpendicular part of acceleration, which causes turning
$\lvert\vec{a}_{\perp}\rvert$	$\sqrt{\vec{a}_{\perp}\cdot\vec{a}_{\perp}} = \lvert\vec{v}\times\vec{a}\rvert/\lvert\vec{v}\rvert$	magnitude of perpendicular acceleration
$\vec{N}$	$\vec{a}_{\perp}/\lvert\vec{a}_{\perp}\rvert$	unit normal vector; direction of turning
R	$\lvert\vec{v}\rvert^2/\lvert\vec{a}_{\perp}\rvert = \frac{\lvert\vec{v}\rvert^3}{\lvert\vec{v}\times\vec{a}\rvert}$	radius of curvature; radius of best local circular approximation