

# Angular Magnitudes

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## Abstract

In classical mechanics, this paper presents alternative definitions of angular magnitudes.

## Angular Magnitudes

The angular magnitudes for a particle A of mass  $m_a$  are defined with respect to a position vector  $\mathbf{r}$  which is constant in magnitude and direction.

Mass Moment	$\mathbf{K}_a = m_a (\mathbf{r} \times \mathbf{r}_a)$
Angular Momentum	$\mathbf{L}_a = m_a (\mathbf{r} \times \mathbf{v}_a)$
Dynamic Moment	$\mathbf{M}_a = m_a (\mathbf{r} \times \mathbf{a}_a)$
Angular Work	$W_a = \int \mathbf{M}_a \cdot d(\mathbf{r} \times \mathbf{r}_a)$
Theorem	$W_a = \Delta \frac{1}{2} m_a (\mathbf{r} \times \mathbf{v}_a)^2$

Where  $\mathbf{r}_a$ ,  $\mathbf{v}_a$ , and  $\mathbf{a}_a$  are the position, the velocity, and the acceleration of particle A.

The angular magnitudes for a system of particles are also defined with respect to a position vector  $\mathbf{r}$  which is constant in magnitude and direction.