

$$1. \quad \vec{\mathbf{r}}_{\text{CM}} = \frac{1}{M} \sum_{i=1}^N m_i \vec{\mathbf{r}}_i$$

$$2. \quad \vec{\mathbf{r}}_{\text{CM}} = \frac{1}{M} \int \vec{\mathbf{r}} \, \mathrm{d}m$$