

top-view.

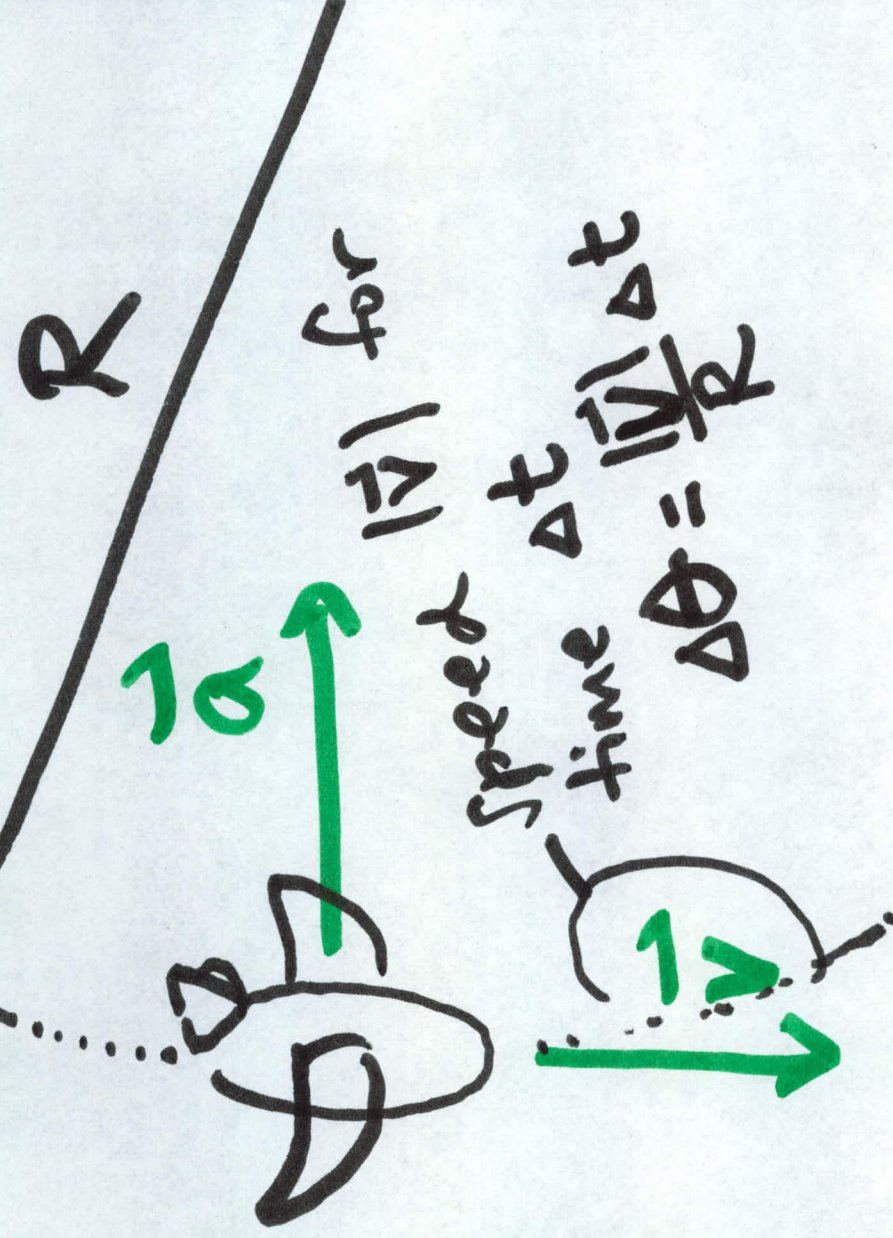


Diagram illustrating the relationship between the change in velocity vector $\vec{V}(t+\Delta t) - \vec{V}(t)$ and the radius R of the circular path. The angle between the vectors is $\Delta\theta$. The arc length is labeled $\Delta s = \frac{|\vec{V}|}{R} \Delta t$.

$$\Delta \vec{V} \approx |\vec{V}| \sin \Delta\theta \approx |\vec{V}| \Delta\theta = \frac{|\vec{V}| |\vec{V}|}{R} \Delta t$$

$$\vec{a} = \frac{\Delta \vec{V}}{\Delta t} \approx \frac{|\vec{V}|^2}{R}$$

becomes "=" in $\lim_{\Delta t \rightarrow 0}$