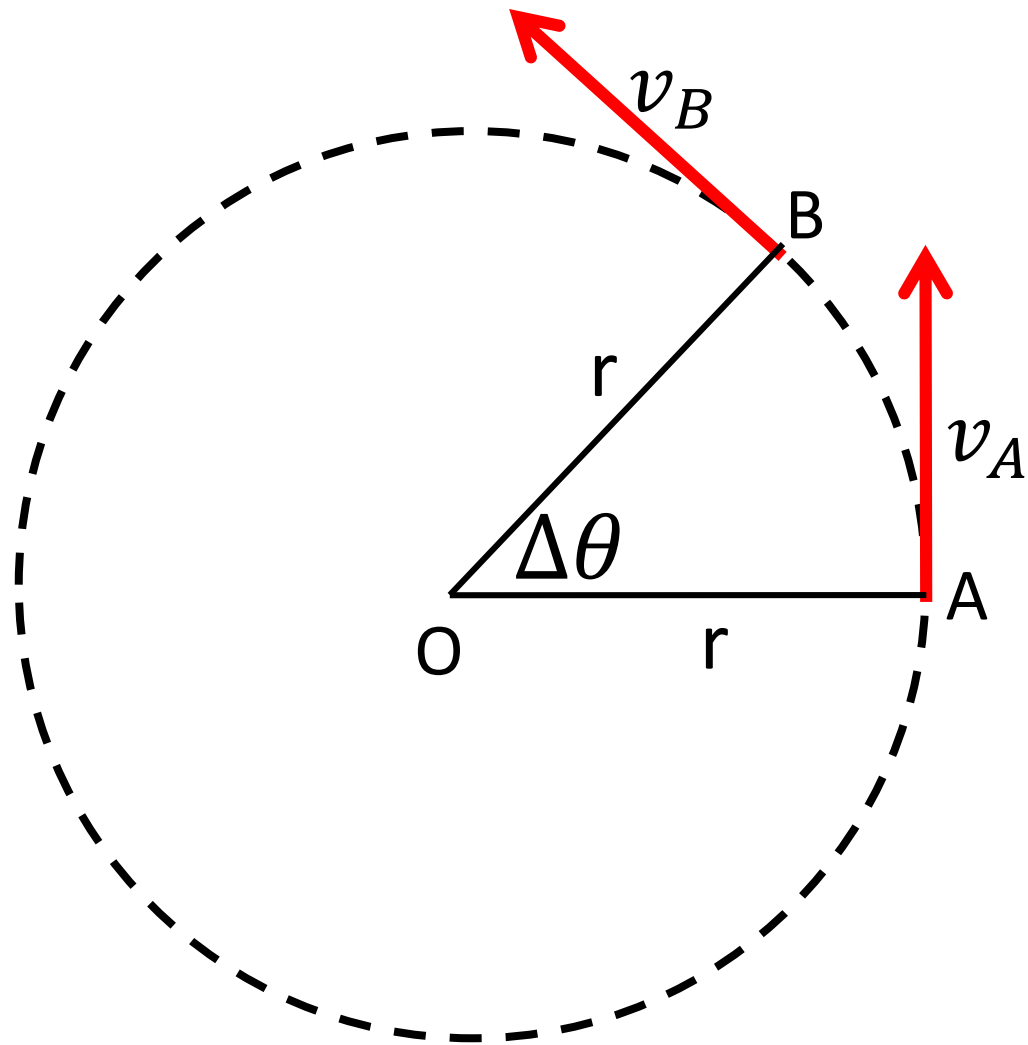


# Movimiento circular y aceleración

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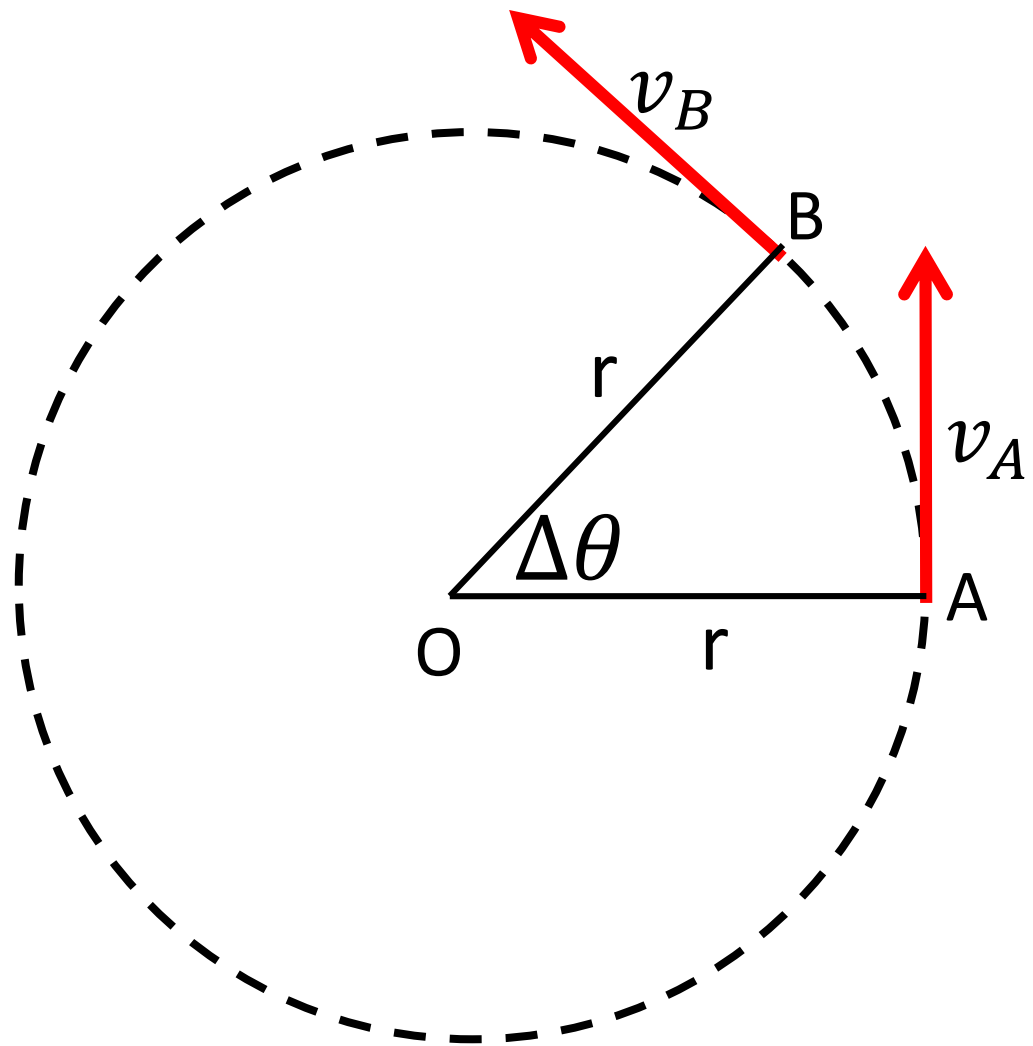


Si la aceleración ( $\vec{a}$ ) es una magnitud **vectorial** igual a la tasa de cambio de la velocidad ( $\Delta\vec{v}$ ):

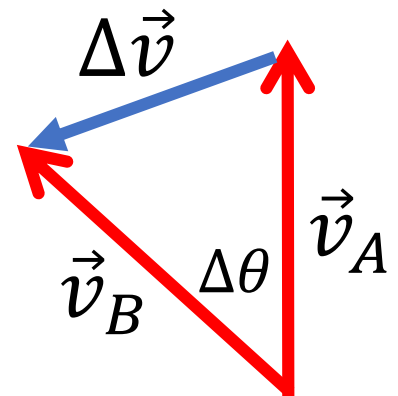
$$\vec{a} = \frac{\Delta\vec{v}}{\Delta t}$$

Y en el movimiento circular uniforme, **el módulo de la velocidad permanece constante**, entonces

**¿Existirá aceleración?**

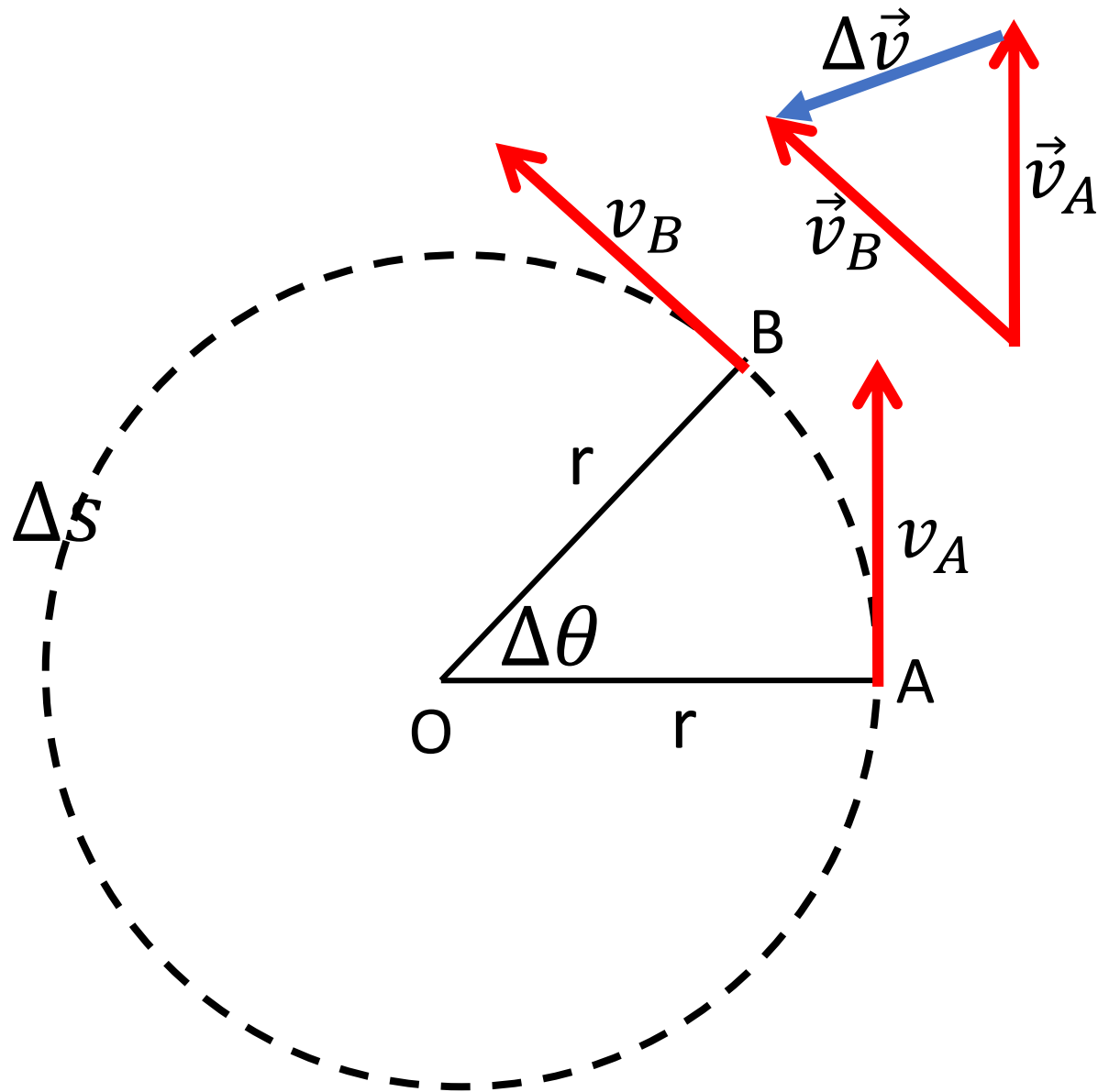


$$\Delta\vec{v} = \vec{v}_B - \vec{v}_A$$



$$\frac{\Delta v}{\sin(\Delta\theta)} = \frac{v_A}{\sin \left( \frac{\pi}{2} - \frac{\Delta\theta}{2} \right)}$$

Si  $\Delta t \rightarrow 0$ , entonces



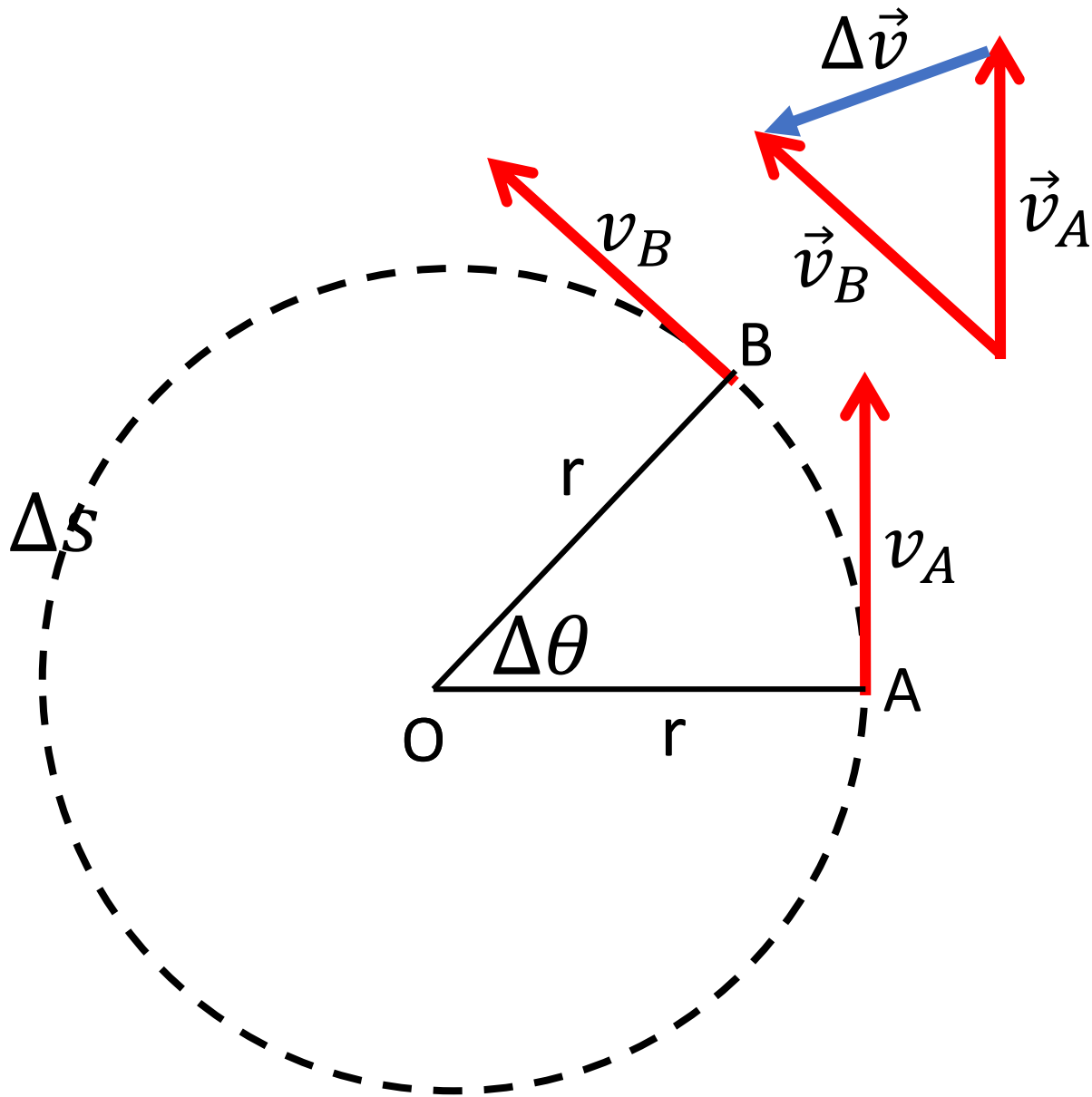
$$\Delta\theta \rightarrow 0 \text{ y}$$

$$\sin(\Delta\theta) \approx \Delta\theta$$

$$\sin \sphericalangle\left(\frac{\pi}{2} - \frac{\Delta\theta}{2}\right) \approx 1$$

$$\frac{\Delta v}{\sin(\Delta\theta)} = \frac{v_A}{\sin \sphericalangle\left(\frac{\pi}{2} - \frac{\Delta\theta}{2}\right)}$$

$$\frac{\Delta v}{\Delta\theta} = \frac{v}{1}$$



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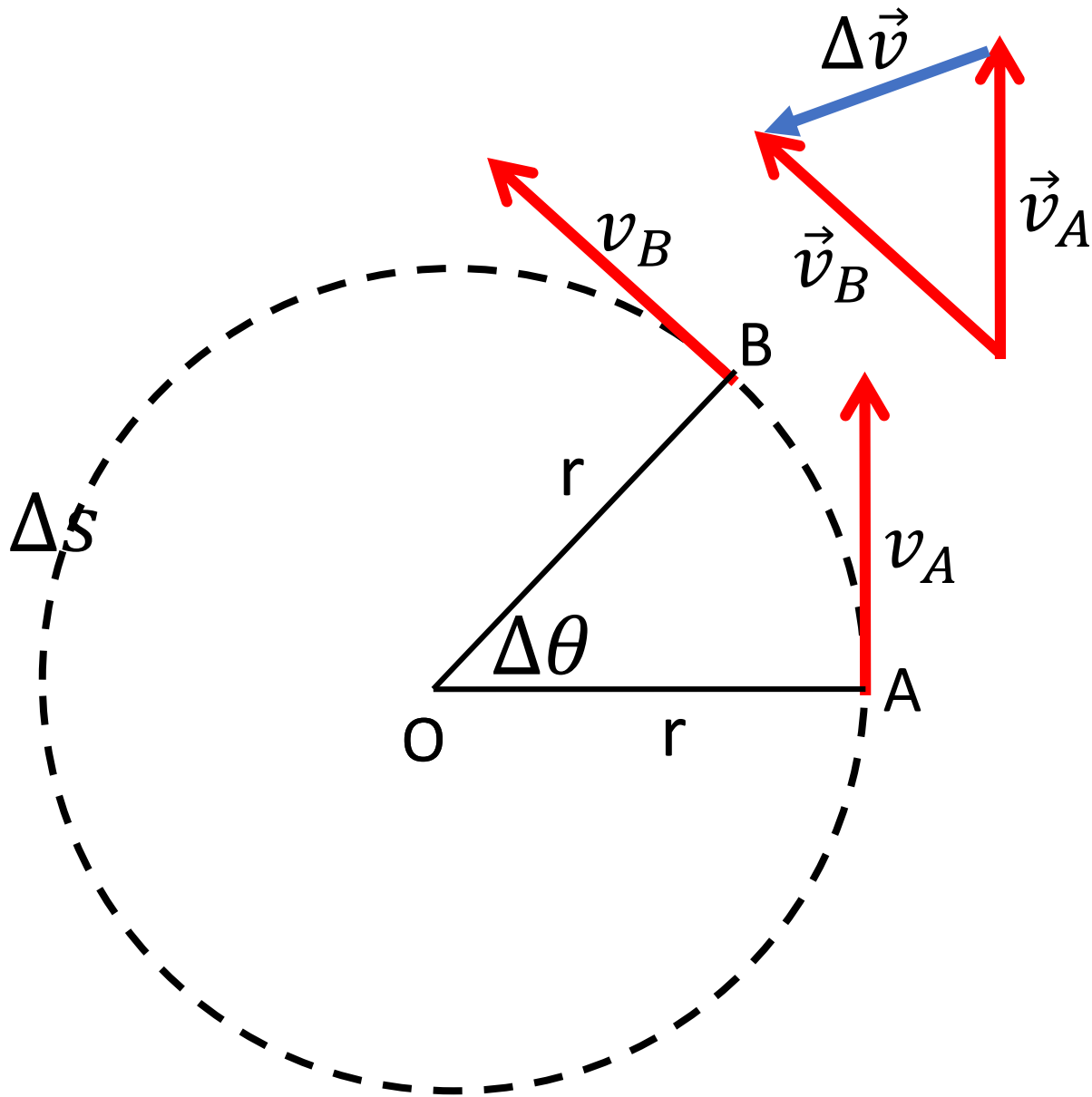
$$\frac{\Delta v}{\Delta\theta} = v$$

$$\Delta v = v \cdot \Delta\theta$$

$$\Delta s = \Delta\theta \cdot r \rightarrow \Delta\theta = \frac{\Delta s}{r}$$

$$v = \frac{\Delta s}{\Delta t} \rightarrow \Delta s = v \cdot \Delta t$$

$$\Delta v = v \cdot \frac{\Delta s}{r} = v \cdot \frac{v \cdot \Delta t}{r}$$

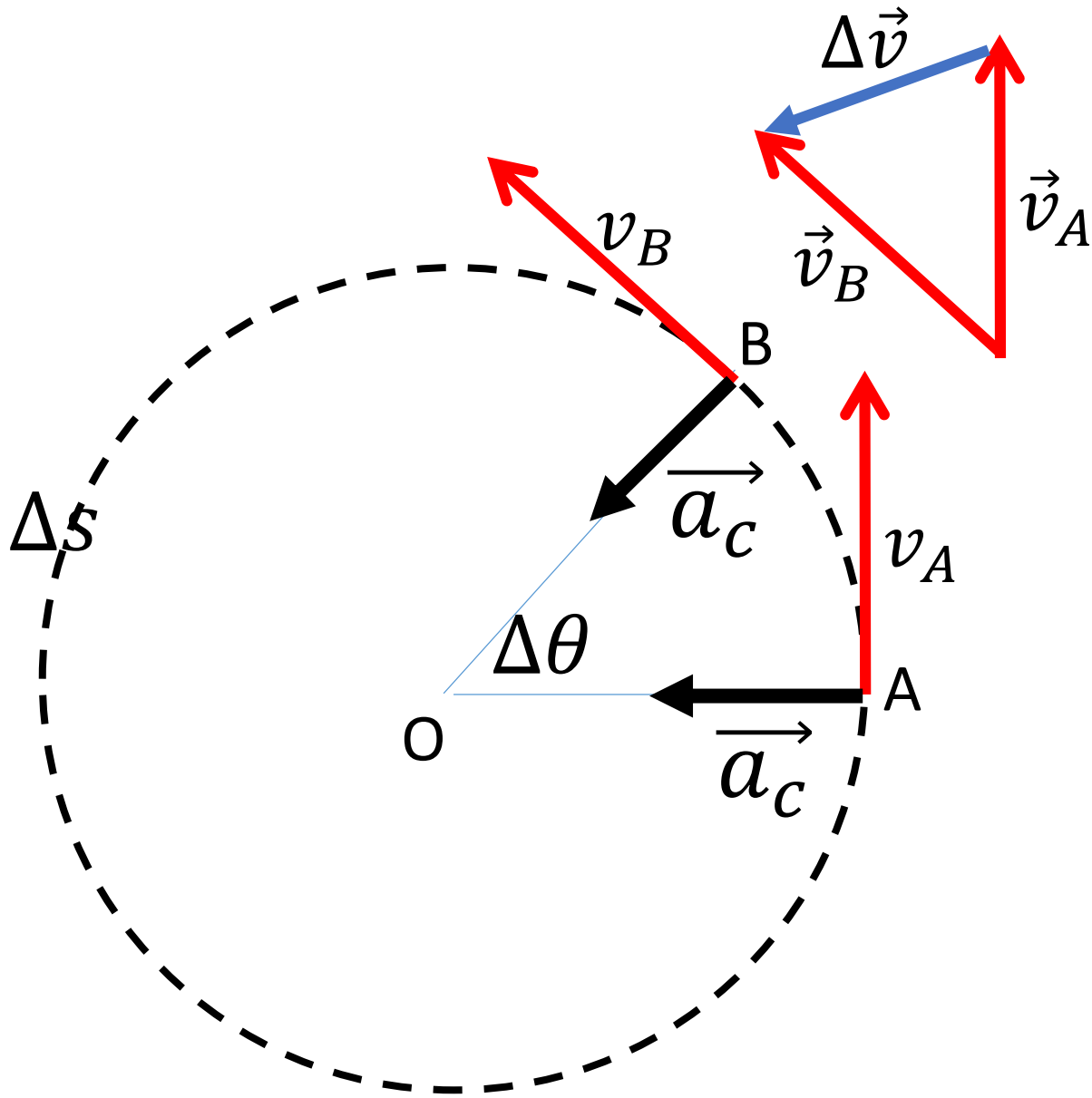


$$\Delta v = v \cdot \frac{\Delta s}{r} = v \cdot \frac{v \cdot \Delta t}{r}$$

$$\Delta v = \frac{v^2 \cdot \Delta t}{r}$$

$$\frac{\Delta v}{\Delta t} = \frac{v^2}{r}$$

$$a_c = \frac{v^2}{r}$$



$$a_c = \frac{v^2}{r}$$

El vector aceleración centrípeta es perpendicular a la velocidad y va dirigido hacia el centro de la trayectoria circular