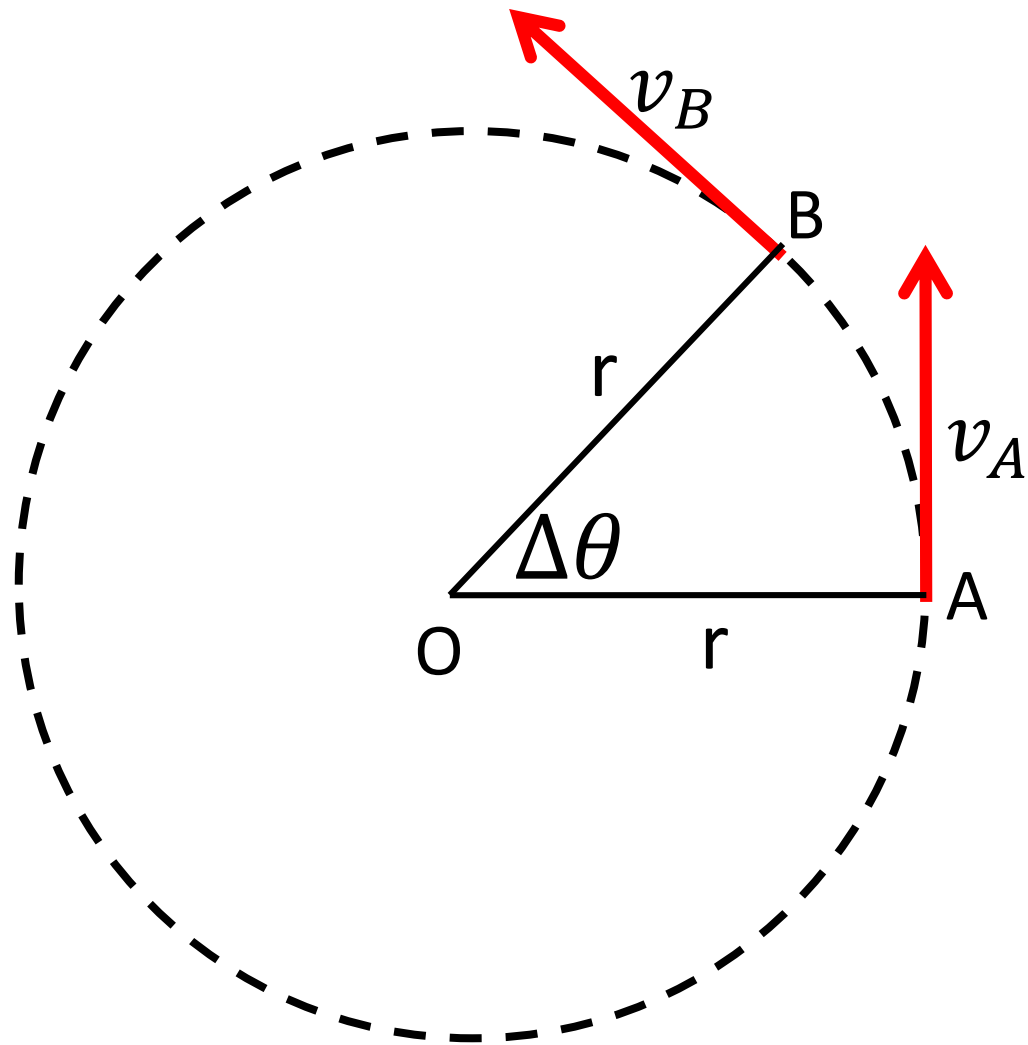


Movimiento circular y aceleración

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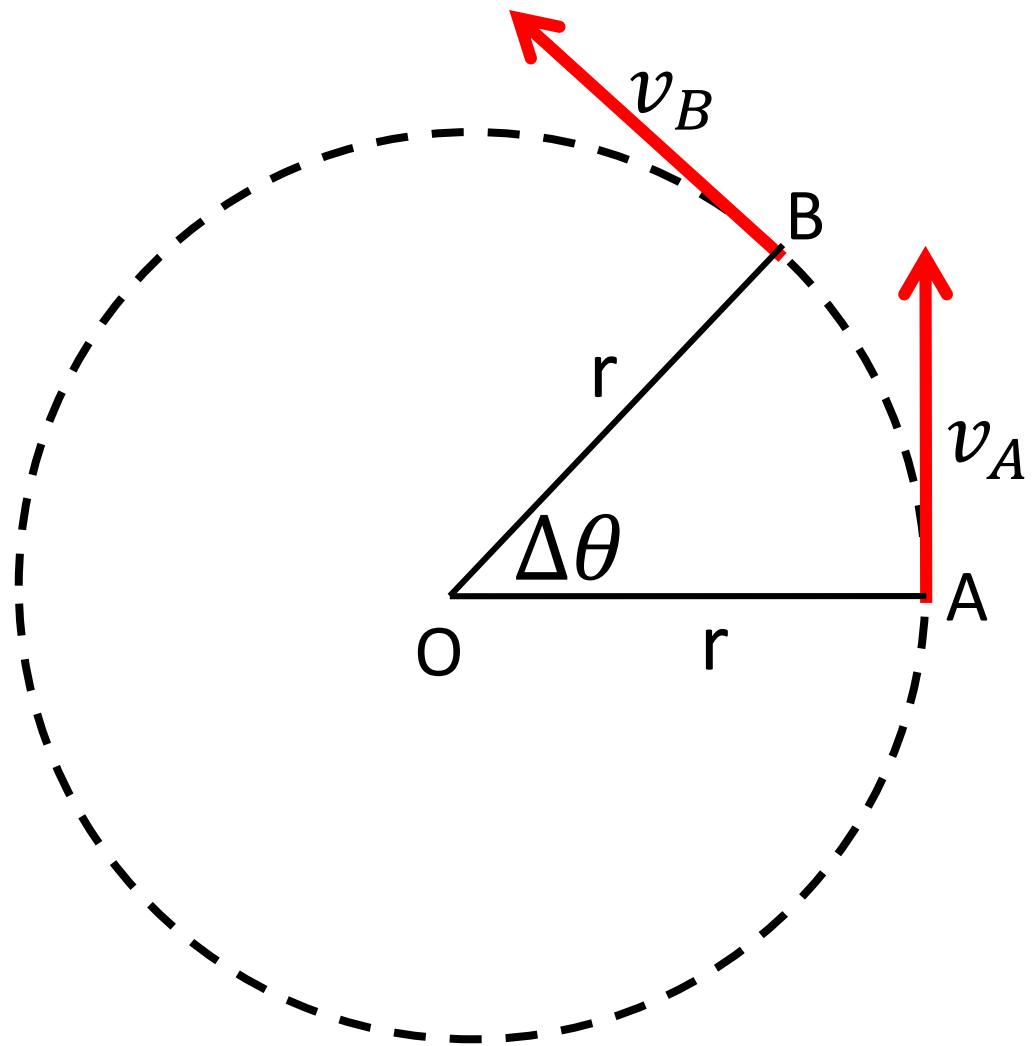


Si la aceleración (\vec{a}) es una magnitud **vectorial** igual a la tasa de cambio de la velocidad ($\Delta\vec{v}$):

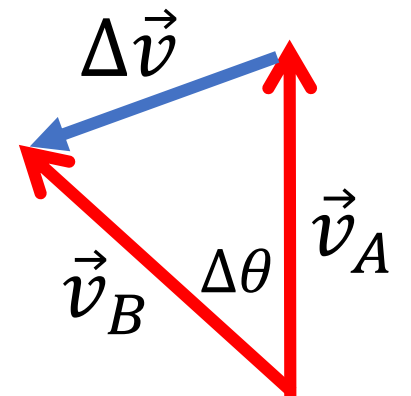
$$\vec{a} = \frac{\Delta\vec{v}}{\Delta t}$$

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

¿Existirá aceleración?

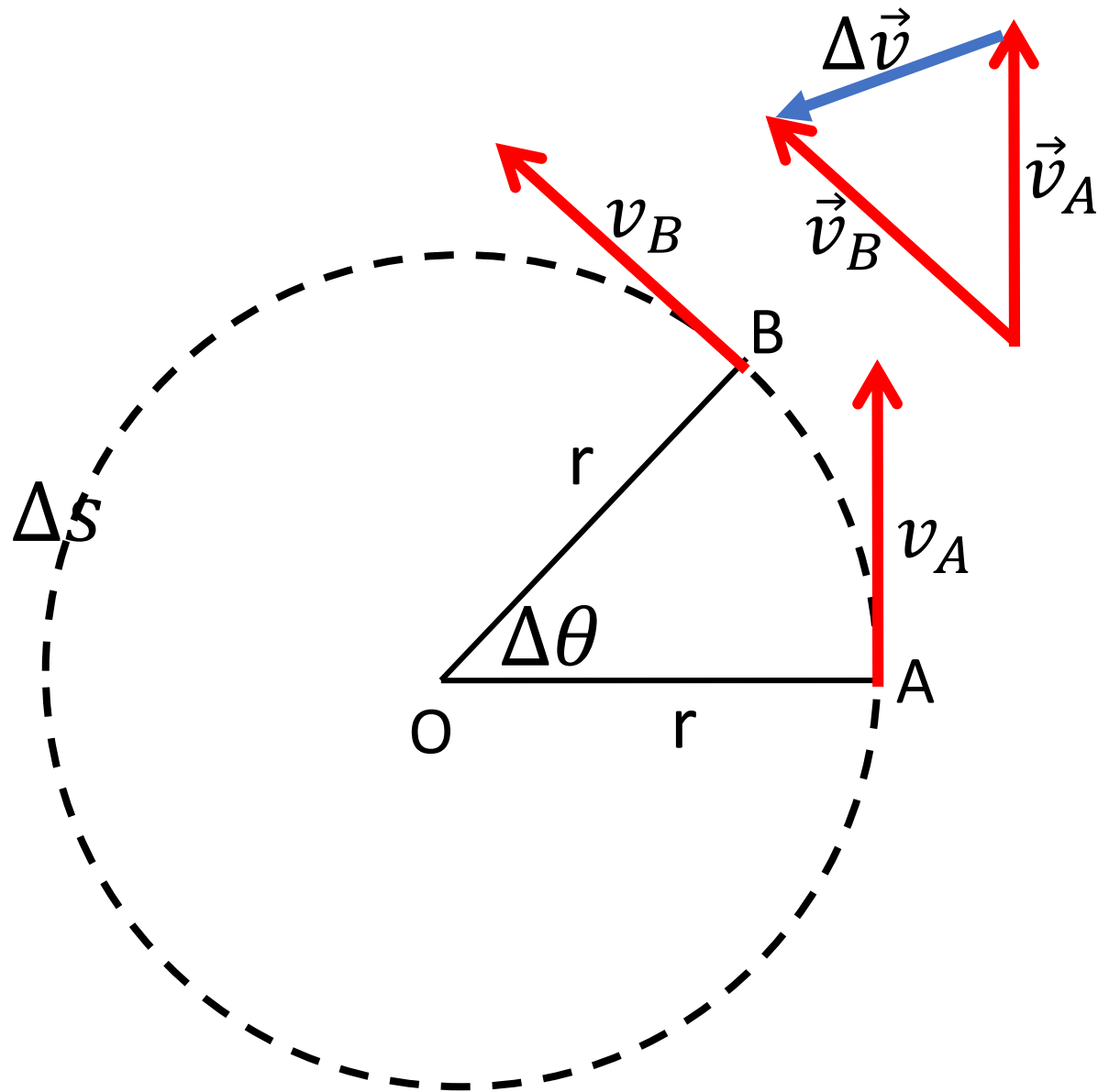


$$\Delta\vec{v} = \vec{v}_B - \vec{v}_A$$



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

Si $\Delta t \rightarrow 0$, entonces



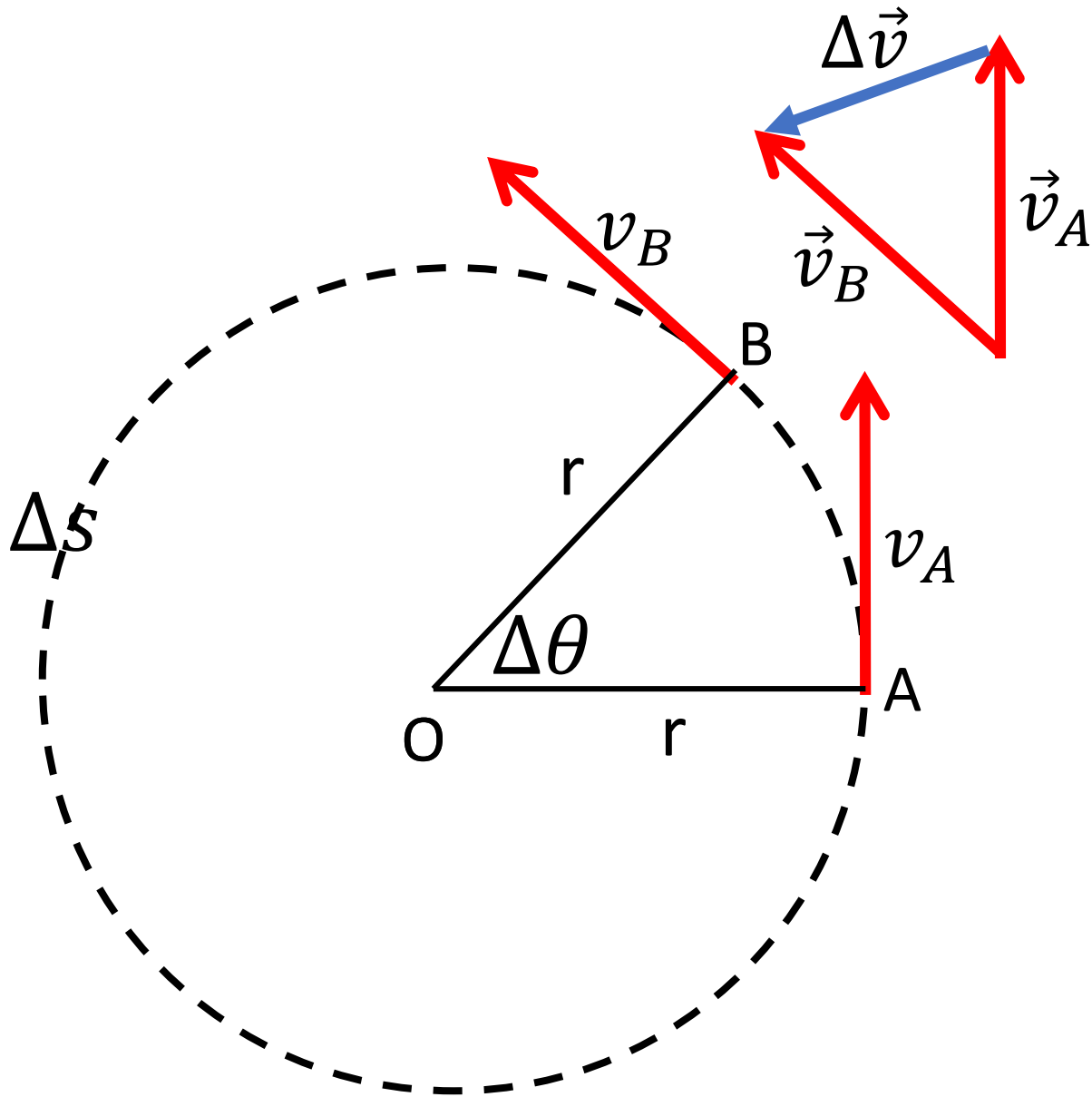
$$\Delta\theta \rightarrow 0 \text{ y}$$

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

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

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

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



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

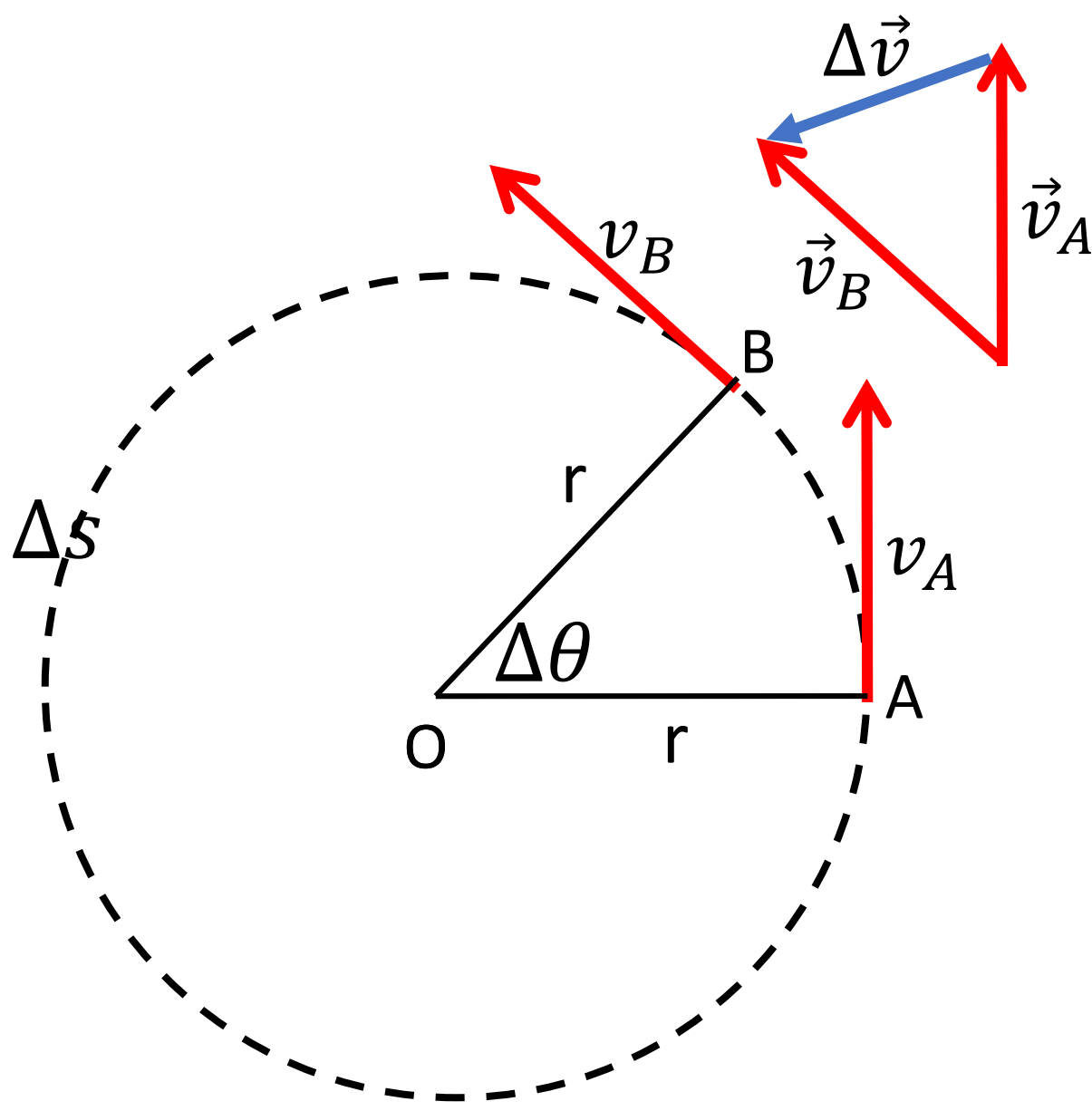
$$\frac{\Delta v}{\Delta\theta} = v$$

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

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

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

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

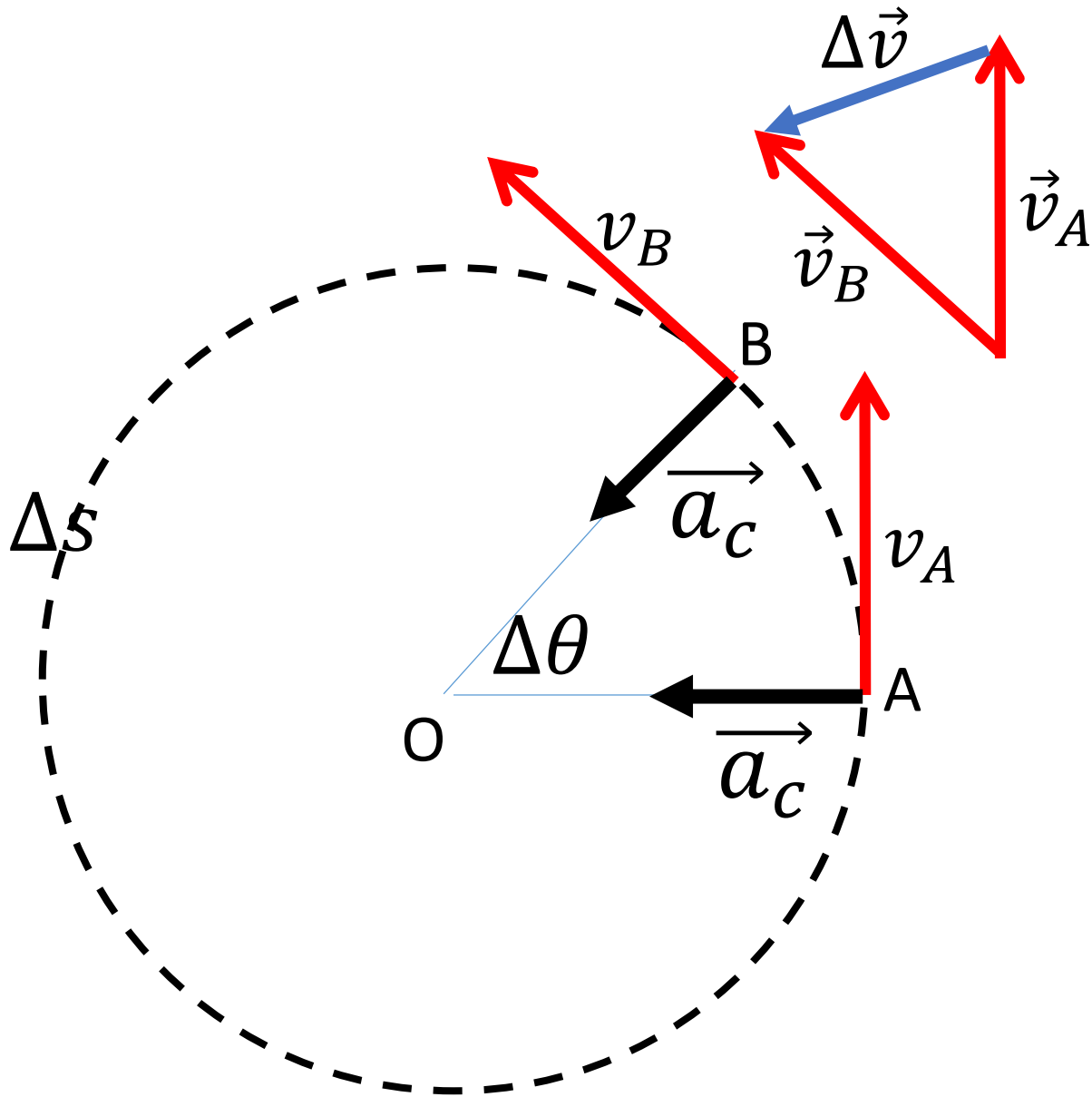


$$\Delta v = v \cdot \frac{\Delta s}{r} = v \cdot \frac{v \cdot \Delta t}{r}$$

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

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

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



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

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