F_n - je projekcia sily do smeru $\Delta\vec{p}$

$$\Delta\vec{p} = \int \vec{F}_n \, dt = \int \frac{q_1 q_2 \cdot r_n \cos\varkappa}{r^2} \, dt$$

$$F_n = F\cos\varkappa$$

$$\varkappa + 90° + \varphi/2 = 180° \Rightarrow \varkappa = 90 - \varphi/2$$

$$\varphi + \varkappa + \chi = 180° \Rightarrow \chi = 180 - (\varphi + \varkappa)$$

$$180 - (\varphi + \varkappa) = 90 - \varphi/2$$

$$\varphi + \varkappa = 90 + \varphi/2$$

$$\cos\varkappa = \cos\left[\left(\frac{\varphi}{2} - \varphi\right) + 90\right] = \sin\left(\varphi/2 - \varphi\right)$$

$$= \sin\left(\varphi - \varphi/2\right)$$

$$\Rightarrow \Delta\vec{p} = q_1 q_2 \int \frac{\sin(\varphi - \varphi/2)}{r^2} \frac{dt\,d\varphi}{d\varphi} =$$

$$= q_1 q_2 \int \frac{\sin(\varphi - \varphi/2)}{r^2 \dot{\varphi}} \, d\varphi$$

To zákona zachovania momentu hybnosti

$$v = \omega r \; ; \quad \omega = \frac{d\varphi}{dt} = \dot{\varphi}$$

$$m.v.r = \text{konšt} = m\omega r^2 = m\frac{d\varphi}{dt} r^2 =$$

$$= m\dot{\varphi} r^2 = \underline{m v . b} \rightarrow \text{plošná rýchlosť}$$

impulz na veľkosť rýchlosti

$$\Rightarrow \boxed{r^2\dot{\varphi} = v\,b}$$

Dosadím do výrazu pre $\Delta\vec{p}$