MATHEMATICAL MODEL FOR ORBITAL TRANSFER

Illustration of Hohmann orbit
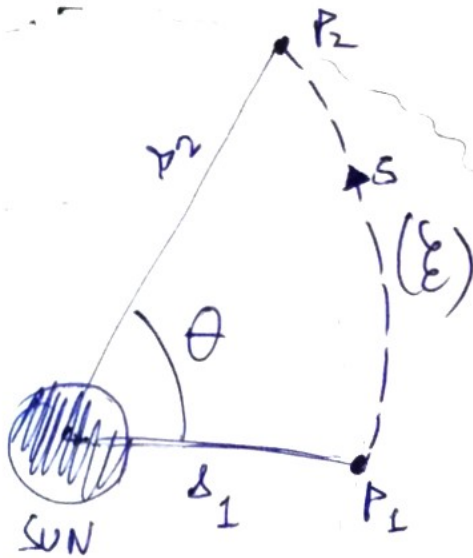
For a rendez-vous between S and P_2, S must be launched from P_1 when:

$$\theta = \pi \left(1 - \frac{T}{T_2} \right)$$

where T_2: period of T_2 (known)

and T: period of the ellipse of transfer as:

$$T^2 = \frac{4\pi^2}{GM_1} (\delta_1 + \delta_2)^3 \quad \left(\begin{array}{l} \text{third} \\ \text{law of} \\ \text{Kepler} \end{array} \right)$$

where G: gravitational constant
M_1: mass of P_1