Feb. 9th, 2026.

$$T^2 = \frac{4\pi^2 a^3}{GM}$$

$$\underset{\text{years}}{T^2} = \underset{\text{AU}}{a^3}$$

Feb. 12th, 2026.

$$\begin{array}{cc} 1 & 1/2 \\ \downarrow & \downarrow \\ 2 & 1 \end{array}$$

$$C_T = \frac{a_p}{a} + 2\sqrt{\frac{a}{a_p}}\sqrt{1-e^2}\cos i$$

$$\cancel{C_T^2 = \frac{a_p^2}{a^2} + 2\frac{a_p}{a}\,2\sqrt{\frac{a}{a_p}}\sqrt{1-e^2}\cos i + 4\frac{a}{a_p}(1-e^2)\cos^2 i}$$

$$\alpha_p \equiv \sqrt{a_p}$$
$$\alpha \equiv \sqrt{a}$$

$$\Rightarrow C_T = \frac{\alpha_p^2}{\alpha^2} + 2\frac{\alpha}{\alpha_p}\sqrt{1-e^2}\cos i \qquad \times \alpha^2$$

$$\Rightarrow (C_T)\alpha^2 = (\alpha_p^2) + \left(\frac{2}{\alpha_p}\sqrt{1-e^2}\cos i\right)\alpha^3$$

$$\Rightarrow \boxed{\left(\frac{2}{\alpha_p}\sqrt{1-e^2}\cos i\right)\alpha^3 - (C_T)\alpha^2 + (\alpha_p^2) = 0}$$