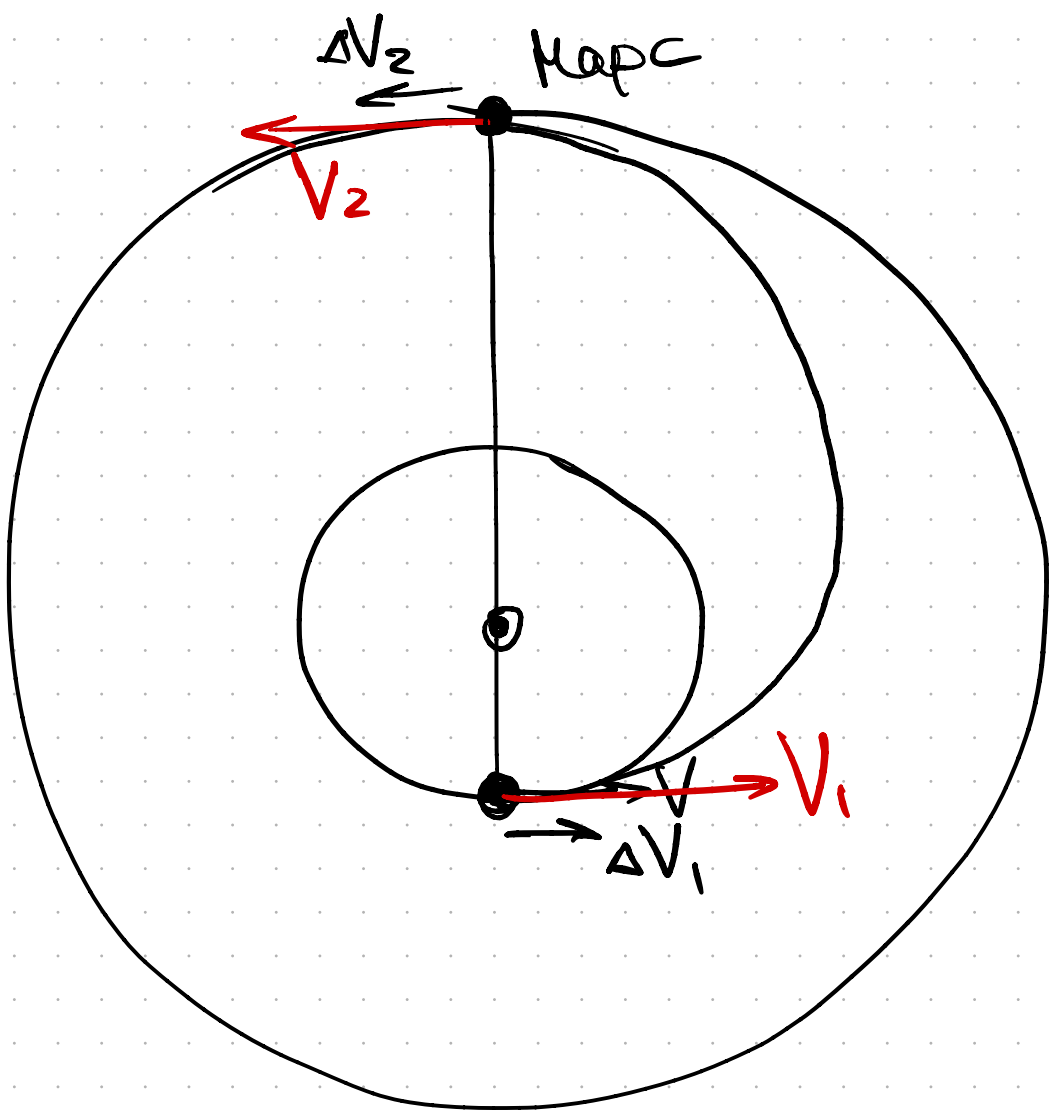


$$a = \frac{a_\oplus + a_M}{2}$$

$$T = a^{3/2}$$

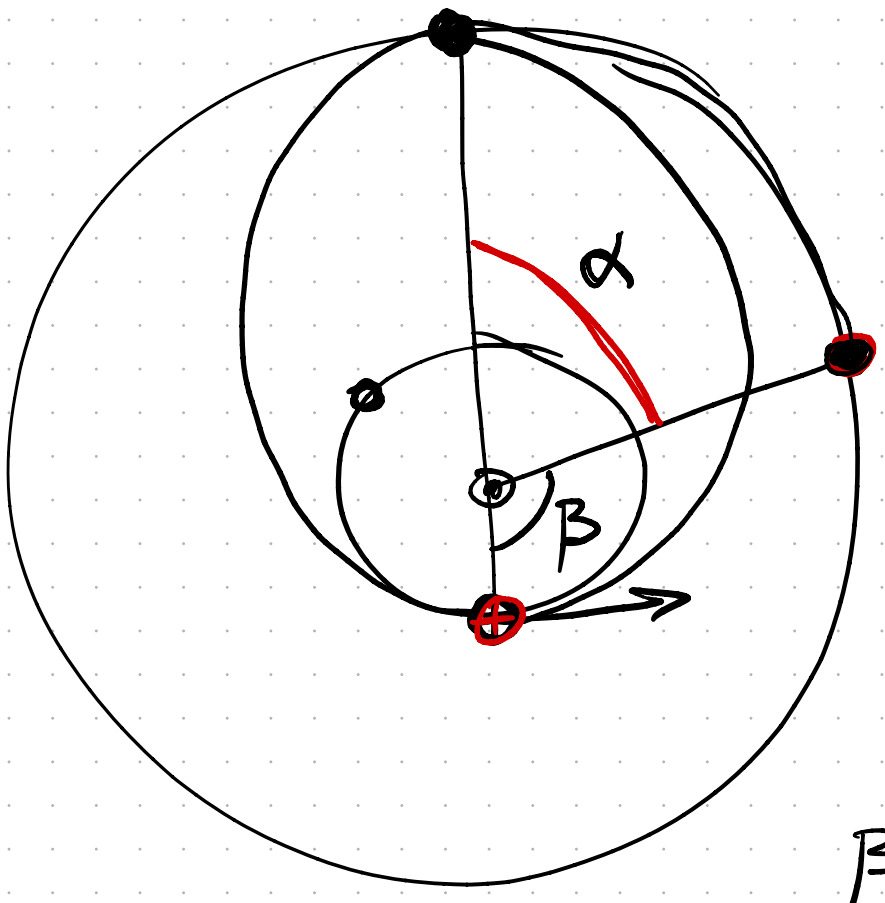
$$t = \frac{1}{2}T$$

$$V_1 = \sqrt{GM\left(\frac{2}{a_\oplus} - \frac{1}{a}\right)}$$

$$\Delta V_1 = V_1 - V$$

$$V_2 = \sqrt{GM\left(\frac{2}{a_M} - \frac{1}{a}\right)}$$

$$\Delta V_2 = V_M - V_2$$



$$a = \frac{a_\oplus + a_M}{2} = 1{,}26 \text{ а.е.}$$

$$T = 1{,}4 \text{ года}$$

$$t = \frac{1}{2}T = \boxed{0{,}7 \text{ года}}$$

$$\alpha = \frac{t}{T_M} \cdot 360^\circ = \frac{t}{\sqrt{a_M^3}} \cdot 360^\circ = 134^\circ$$

$$\beta = 180^\circ - \alpha = \boxed{46^\circ}$$

$$T = \boxed{2{,}14 \text{ года}}$$

$$V = \sqrt{\frac{GM}{a_\oplus}} \qquad a = \frac{a_\oplus + a_p}{2}$$

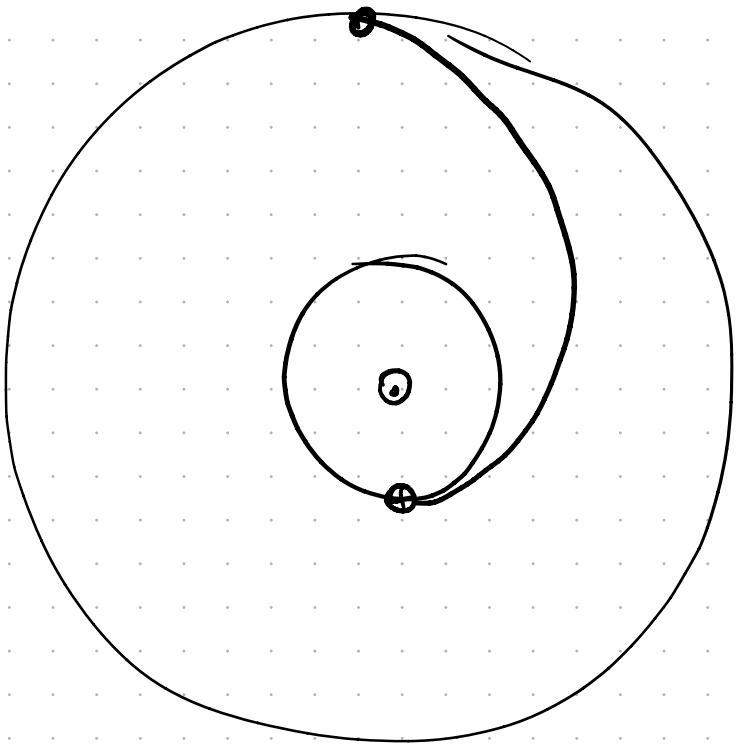
$$V' = \sqrt{GM\left(\frac{2}{a_\oplus} - \frac{1}{a}\right)}$$

$$\Delta V = V' - V$$

Марс: $\Delta V_M = 3$ км/с

Юпитер: $\Delta V_{Ю} = 8{,}8$ км/с

Сатурн: $\Delta V_C = 10{,}3$ км/с

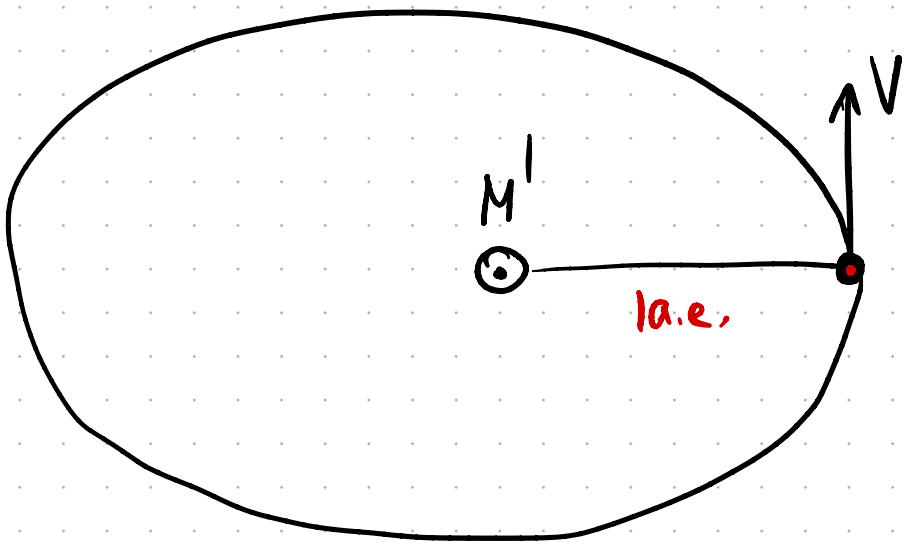


$$a = \frac{a_\oplus + a_0}{2} = 1{,}75 \text{ а.е.}$$

$$T = \sqrt{a^3} = 2{,}3 \text{ года}$$

$$t = \frac{T}{2} = 1{,}16 \text{ года}$$

$$V_1 = \sqrt{GM\left(\frac{2}{a_\oplus} - \frac{1}{a}\right)} - \sqrt{\frac{GM}{a_\oplus}} = 5{,}8 \text{ км/с}$$



$$V = \sqrt{\frac{GM}{a_\oplus}}$$

$$V = \sqrt{GM'\left(\frac{2}{a_\oplus} - \frac{1}{a'}\right)}$$

$$a' = \left(\frac{2}{a_\oplus} - \frac{V^2}{GM'}\right)^{-1} = 1{,}74 \text{ а.е.}$$

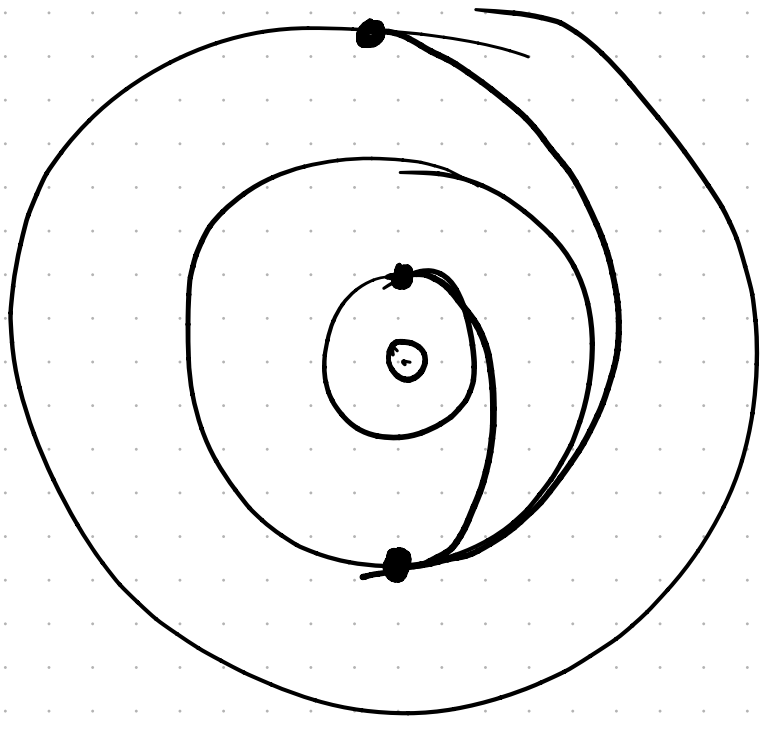
$$q = 1 \text{ а.е.}$$

$$q = a'(1-e) \rightarrow e = 1 - \frac{q}{a'} = 1 - \frac{a_\oplus}{a'}$$

$$e = 0{,}43$$

$$Q = a'(1+e) = 2{,}49 \text{ а.е.}$$

$$\frac{T'^2}{4\pi^2} = \frac{a'^3}{GM'} \rightarrow T = 2\pi\sqrt{\frac{a'^3}{GM'}} = 2{,}75 \text{ года}$$



$a_V = 0{,}86$ а.е. $t_V = 0{,}4$ года

$a_M = 1{,}26$ а.е. $t_M = 0{,}8$ года

$$t_V < t_M$$

Марс: $\Delta V_1 = 2{,}93$ км/с

$\Delta V_2 = 2{,}64$ км/с

Венера: $\Delta V_1 = 2{,}75$ км/с

$\Delta V_2 = 2{,}54$ км/с

$\Delta V_M = 5{,}57$ км/с $\quad \Delta V_V = 5{,}29$ км/с $\quad \Delta V_V < \Delta V_M$