

### Task 5

Plot the trajectory of the moon relative to the sun by solving the equations describing the movement of Earth around the sun and the moon relative to the Earth

For the purposes of the solution, we assume that the Earth is moving in a circular orbit, the Moon is moving in a circular orbit relative to Earth.

$$G = 6,6743 \cdot 10^{-11} \left[ \frac{Nm^2}{kg^2} \right] - \text{gravitational constant}$$

$$M_S = 1,989 \cdot 10^{30} kg - \text{mass of the Sun}$$

$$M_Z = 5,972 \cdot 10^{24} kg - \text{mass of the Earth}$$

$$M_k = 7,347 \cdot 10^{22} - \text{mass of the Moon}$$

$$R_{ZS} = 1,5 \cdot 10^8 km - \text{Earth Sun distance}$$

$$R_{ZK} = 384400 km - \text{Earth Moon distance}$$

Solve equations of motion using the improved Euler method (MidPoint)