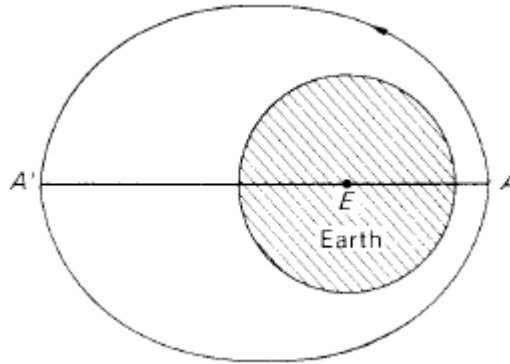


Answer on Question #54957, Physics / Astronomy | Astrophysics

We need draw the artificial satellite is at perigee at A (the point in its orbit nearest the Earth's centre E) and at apogee at A' (when it is farthest from the Earth's centre):



The size of the major axis AA' of the ellipse is given by:

$$AA' = 4023 + 2 \times 6372 + 660 = 17\,427 \text{ km}$$

So that the semi-major axis a is of length 8713.5 km . The period of revolution is $T_1 = 134$ minutes. For the Earth orbit:

$$a = 149.5 \times 10^6 \text{ km}$$

$$T = 365.25 \times 24 \times 60 = 5.2596 \times 10^5 \text{ minutes.}$$

Letting M and m be the masses of Sun and Earth respectively, we have, using equation:

$$\frac{m}{M} = \left(\frac{134}{5.2596 \times 10^5} \right)^2 \left(\frac{149.5 \times 10^6}{8713.5} \right)^3 = 327800$$

Answer: $m/M = 327800$

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