

Answer on question #78155

State Kepler's laws. Calculate the time period of a comet moving in an elliptical orbit about the Sun. It is given that the length of the semi-major axis of the orbit is 3.0×10^{12} m.

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

$$T^2 = \frac{4\pi^2 a^3}{GM_{sun}} = \frac{4 \cdot (3.14)^2 \cdot (3 \cdot 10^{12})^3}{6.67 \cdot 10^{-11} \cdot 1.9885 \cdot 10^{30}}$$

$$T = 2.833 \cdot 10^9 \text{ sec}$$

The time period of a comet moving in an elliptical orbit about the Sun $T = 2.833 \cdot 10^9$ sec

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