Answer on Question #48038, Physics, Astronomy — Astrophysics
Most asteroids are found between 2.1 and 3.3 AU. Use Kepler's third law to
calculate the range of orbital periods associated with these orbital sizes
Solution
Use Kepler's third law tells us that expression

$$\frac{P^2}{a^3}$$

is the same for all planets, where P is period and a is distance. Hence, for
$a_2 = 2.1$ and $a_3 = 3.3$ AU we have periods

$$P_2 = P_1\frac{a_2^{3/2}}{a_1^{3/2}}, \quad P_3 = P_1\frac{a_3^{3/2}}{a_1^{3/2}}$$

$$P_2 = 1\,yr \cdot \frac{2.1^{3/2}}{1^{3/2}} \approx 3\,yr, \quad P_3 = 1\,yr \cdot \frac{3.2^{3/2}}{1^{3/2}} \approx 5.7\,yr$$