PHYS 321 Homework Assignment #3
Due: Friday, 20 September 2002

1. Halley’s Comet has an elliptical orbit with semi-major axis 17.94175555 AU and eccentricity 0.967277241. Its last perihelion was February 9, 1986. Calculate the perihelion distance and the expected date of the next perihelion.

2. Suppose you could drop something from the radius of the Earth’s orbit into the Sun. How long would it take to reach the Sun’s radius (about 700,000 km)?

3. Use the relation

\[ \frac{m}{dt} = \vec{F}_{ext} - \frac{dm}{dt} \]  \hspace{1cm} \text{(B&O Eq. 4.23)}

\[ \text{to explain why it is advantageous to accelerate close to a planet, when changing course in space. (Neglect the effect of the planet’s motion, which is discussed in B&O, p. 159ff.)} \]