

Exercise 15.1

Orbital Motion of a Comet

1. Logon to **Skylab2** and select the program "Planetmation." From the menu bar, select "Viewangle." Then set the "Inclination" to 0.0° and the "Azimuth" to 72° . Now set the distance to 29 AU.
2. Type "H" to plot the orbit of Halley's comet.
3. Under the options menu set the step to 5 days.
4. With the help of the right and left cursor keys, run the animation to find when Halley's comet is at the next aphelion and record the date and year below. You may expect an error of 2 or more months. **Obtain a hardcopy** of the screen image showing your result.

Month: _____ Day: _____ Year: _____

Draw the major and minor axis on this chart to assist you in doing the following:

5. Now let the program run until you find the date and year when the comet will be at what you judge to be the end of the minor axis of the orbit (this is just inside the orbit of Uranus). **Get a hardcopy** and record the date below:

Month: _____ Day: _____ Year: _____

Also draw the major and minor axis on this chart.

6. To determine the date of perihelion, reduce the step size to 1 day to make a more accurate determination. Also, zoom in to about 4AU, then search for the date and year when the comet will next be at perihelion and record below. **Obtain a hardcopy** of the screen after you have made your determination.

Month: _____ Day: _____ Year: _____

The following analysis is to be done at home or in the lab room according to your instructor's directions.

7. Compute how many years, and decimal parts thereof, it took the comet to move from aphelion to the end of its minor axis. See part D of the on-line document "Time" on how to do this. Record the result below:

Length of time: _____

8. How many years, and decimal parts thereof, did it take the comet to move from the end of its minor axis to the next perihelion? Record below:

Length of time: _____

9. Compare the answers 7 and 8. What planetary law have you just verified?

Answer: _____ .