

In this exercise you will examine two photographs of Jupiter and from the measurement of the Great Red Spot determine the rotational period of the planet. The photograph on page two contain two images taken on 12/24/2003. The times that the images were taken are indicated below each image. You are to measure the angular distance that the Great Red Spot has moved between the first and second images and record the time difference between the two images. To measure the angular distance you must first measure the linear diameter of Jupiter at the latitude of the Great Red Spot. Dividing this diameter by 2 gives the radius at the latitude of the Great Red Spot. Next, measure the linear distance that the Great Red Spot has moved between the first and second images. Try measuring the Great Red Spot from the limb (edge) of the planet and make sure that you make your measurements parallel to the bands. **Be sure to include units with your measurements.**

Time difference (minutes): \_\_\_\_\_

Linear diameter at latitude of spot: \_\_\_\_\_

Linear radius at latitude of spot: \_\_\_\_\_

Linear distance the spot has moved: \_\_\_\_\_

In order to convert the linear measurements to an angle the following relationship can be used as an approximation:

$$\text{Angular distance} = 57.3^\circ \times \frac{\text{measured linear distance the spot moved}}{\text{Measured radius at the latitude of the spot}}$$

Angular distance: \_\_\_\_\_

Since one rotation of the planet is equal to 360 degrees a proportion can be set up to get the period of rotation in minutes from the angular distance and time difference.

$$\frac{\text{Angular distance}}{360^\circ} = \frac{\text{Time difference}}{\text{Period}}$$

Solving for the period we have:

$$\text{Period} = \frac{\text{Time difference}}{\text{Angular distance}} \times 360^\circ$$

Period (minutes): \_\_\_\_\_.

Now divide your result by the number of minutes in an hour.

Period (hours): \_\_\_\_\_

