Earth Science Regents
Star Trails Practice

Name _____

Period ____ Date _____



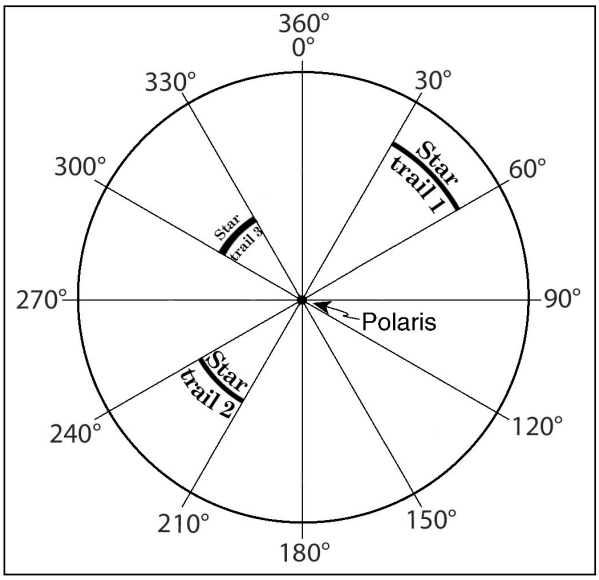
Base your answers to the following questions on a camera that was placed outside at night and pointed directly at Polaris and several other stars for four nights. The lens was kept open and a time-exposure photograph was taken each night. The diagrams below represent the photographs of Polaris and star trails, with an angular protractor to measure apparent motion each night.

It's best to rearrange the "Rate of change" formula (see Earth Science Reference Tables; page 1) to solve for "time", rather than rate of change (or speed) for this work. With your teacher's help, complete this algebraic task immediately below.

$$\text{Rate of change} = \frac{\text{change in value}}{\text{time}}$$

**1)** Determine how many hours was the lens kept open to create the star trails in each photograph below. Remember to show all work! (**Hint**: You must know the cause of the apparent motion of the stars viewed from earth.)

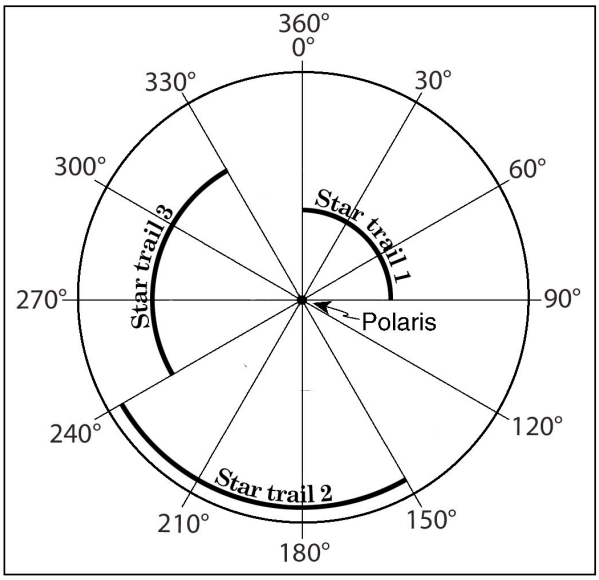
**NIGHT 1 STAR TRAILS**




**WORK**:

**ANSWER**: _____

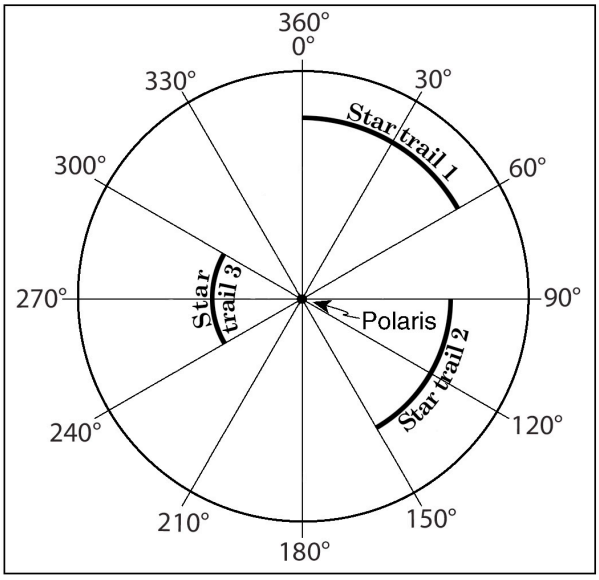
**NIGHT 2 STAR TRAILS**




**WORK**:

**ANSWER**: _____

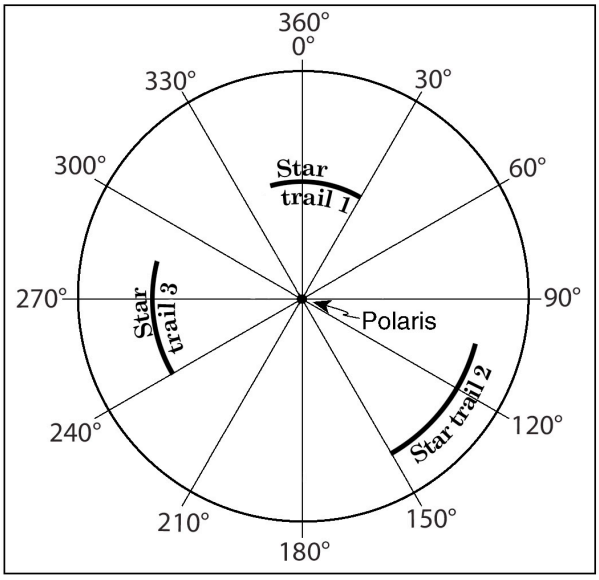
**NIGHT 3 STAR TRAILS**




**WORK**:

**ANSWER**: _____

**NIGHT 4 STAR TRAILS**




**WORK**:

**ANSWER**: _____

2) Explain how you determined your answers to the above questions:

_____

_____

3) Write a relationship sentence describing how the length of star of trails is related to the time-exposure of a photograph:

_____

_____

_____

_____

_____

4) Complete the star trails relationship graph below: