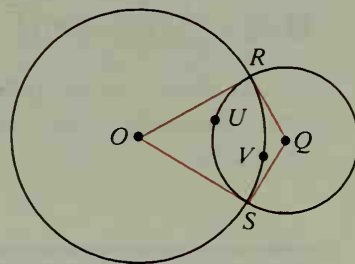


- C 21.** Given:  $\odot O$  and  $\odot Q$  intersect at  $R$  and  $S$ ;

$$m\widehat{RVS} = 60; m\widehat{RUS} = 120$$

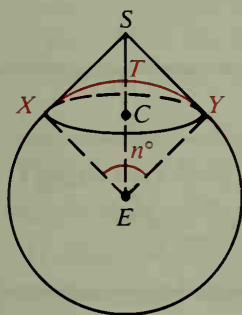
Prove:  $\overline{OR}$  is tangent to  $\odot Q$ ;

$\overline{QR}$  is tangent to  $\odot O$ .



- 22.** Given:  $\overline{AB}$  is a diameter of  $\odot Z$ ; points  $J$  and  $K$  lie on  $\odot Z$  with  $m\widehat{AJ} = m\widehat{BK}$ . Discover and prove something about  $\overline{JK}$ . (*Hint: There are two possibilities, depending on whether  $\widehat{AJ}$  and  $\widehat{BK}$  lie on the same side of  $\overline{AB}$  or on opposite sides. So your statement will be of the either . . . or type.*)

The diagram, not drawn to scale, shows satellite  $S$  above the Earth, represented as sphere  $E$ . All lines tangent to the Earth from  $S$  touch the Earth at points on a circle with center  $C$ . Any two points on the Earth's surface on or above that circle can communicate with each other via  $S$ .  $X$  and  $Y$  are as far apart as two communication points can be. The Earth distance between  $X$  and  $Y$  equals the length of  $\widehat{XTY}$ , which equals  $\frac{n}{360} \cdot \text{circumference of the Earth}$ . That circumference is approximately 40,200 km and the radius of the Earth is approximately 6400 km.



- 23.** The photograph above shows the view from Gemini V looking north over the Gulf of California toward Los Angeles. The orbit of Gemini V ranged from 160 km to 300 km above the Earth. Take  $S$  to be 300 km above the Earth. That is,  $ST = 300$  km. Find the Earth distance, rounded to the nearest 100 km, between  $X$  and  $Y$ . (*Hint: Since you can find a value for  $\cos \frac{n^\circ}{2}$  you can determine  $n^\circ$ .*)
- 24.** Repeat Exercise 23, but with  $S$  twice as far from the Earth. Note that the distance between  $X$  and  $Y$  is not twice as great as before.