

Challenge: Skills and Applications

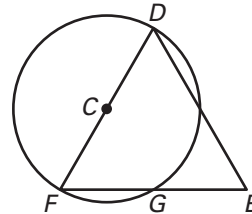
For use with pages 613–620

1. Refer to the diagram. Write a paragraph proof.

Given: $\odot C$, $\overline{FG} \cong \overline{GE}$

Prove: $\triangle DEF$ is isosceles.

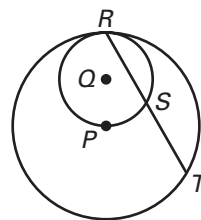
(Hint: Draw an additional segment.)



2. Refer to the diagram. Write a paragraph proof.

Given: $\odot Q$ and $\odot P$ are tangent at R .

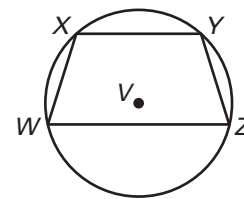
Prove: $\overline{RS} \cong \overline{ST}$



3. Refer to the diagram. Write a paragraph proof.

Given: $\overline{WZ}$ is a base of trapezoid $WXYZ$ inscribed in $\odot V$.

Prove: $WXYZ$ is an isosceles trapezoid.



4. In this exercise, you will use a circle to prove the Pythagorean Theorem.

Given right triangle $\triangle OPQ$ with side lengths a , b , and c , as shown, draw a circle centered at O with radius c . Let R and S be the points where $\overleftrightarrow{OP}$ intersects the circle, as shown.

a. Find lengths OR and PS in terms of a , b , and c .

b. What kind of triangle is $\triangle QRS$?

c. Use a Geometric Mean Theorem to write an equation involving PQ .

d. Now show that $a^2 + b^2 = c^2$.

