

P.I. G.G.27: Write a proof arguing from a given hypothesis to a given conclusion

1. Prove that the measure of an angle formed by a secant and a tangent drawn from a point outside the circle is half the difference of the measure of the intercepted arcs.
2. $\triangle ABC$ is inscribed in a circle and $\widehat{AB} \cong \widehat{AC}$. Prove that $\triangle ABC$ is isosceles.
3. Construct several pairs of intersecting tangents to a circle. Measure the central angle formed by the radii and the angle at the point of intersection of the tangents. What appears to be true? Can you prove it?

[1] Check students' proofs; the proof is similar to the case of two secants.

Students should state that since $\angle B$ and $\angle C$ intercept equal arcs and are equal to half the measure of those arcs, they are congruent. Thus the triangle is isosceles by the definition of isosceles triangles.

[2]

The angles appear to be supplementary. Yes, in the quadrilateral formed by the tangents and the radii, the two angles at which the radii intersect the tangents measure 90° , so the remaining pair must be supplementary.

[3]