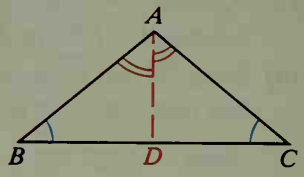
Theorem 4-2

If two angles of a triangle are congruent, then the sides opposite those angles are congruent.

Given: $\angle B \cong \angle C$

Prove: $\overline{AB} \cong \overline{AC}$



Plan for Proof: You can show that $\overline{AB}$ and $\overline{AC}$ are corresponding parts of congruent triangles. Draw the bisector of $\angle A$ as your auxiliary line, show that $\angle ADB \cong \angle ADC$, and use ASA.

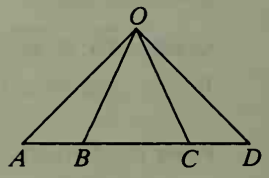
Corollary

An equiangular triangle is also equilateral.

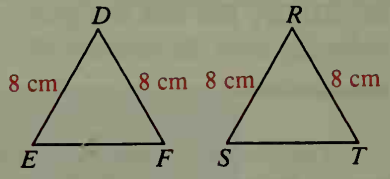
Notice that Theorem 4-2 is the converse of Theorem 4-1, and the corollary of Theorem 4-2 is the converse of Corollary 1 of Theorem 4-1.

Classroom Exercises

1. If $\triangle AOD$ is isosceles, with $\overline{OA} \cong \overline{OD}$, then $\angle \_\_?\_\_ \cong \angle \_\_?\_\_$.
2. If $\triangle BOC$ is isosceles, with $\overline{OB} \cong \overline{OC}$, then $\angle \_\_?\_\_ \cong \angle \_\_?\_\_$.
3. If $\triangle AOD$ is an isosceles right triangle with right $\angle AOD$, then the measure of $\angle A$ is $\_\_?\_\_$.

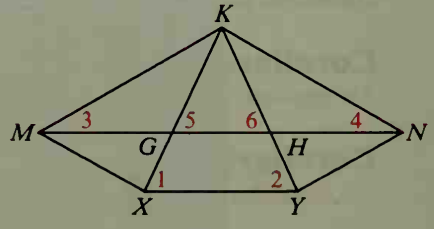


4. Given the triangles at the right, which of the following can you conclude are true?
   - a. $\angle D \cong \angle R$
   - b. $\overline{DE} \cong \overline{DF}$
   - c. $\overline{DF} \cong \overline{RT}$
   - d. $\angle E \cong \angle F$
   - e. $\angle E \cong \angle S$
   - f. $\angle S \cong \angle T$



Given the two congruent angles, name two segments that must be congruent.

5. $\angle 1 \cong \angle 2$
6. $\angle 3 \cong \angle 4$
7. $\angle 5 \cong \angle 6$
8. Is the statement "$\overline{MK} \cong \overline{NK}$ if and only if $\angle 3 \cong \angle 4$" true or false?



9. Explain how Corollary 1 follows from Theorem 4-1.
10. Explain how Corollary 2 follows from Corollary 1.
11. Explain how Corollary 3 follows from Theorem 4-1.
12. Explain how the Corollary follows from Theorem 4-2.