AMDG

NAME | Chapter 3: Congruent Triangels | Ms. Kresovic

Adv Geo | Axiomatic System Notebook (ASN) | Date

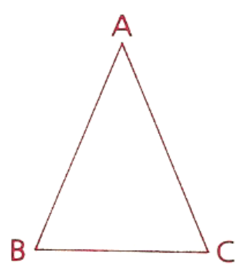
3.1 D	**Definition** ***Congruent triangles*** ⇔ all pairs of corresponding parts are congruent. Remember, an arrow symbol (⇒) means "implies" ("If . . ., then . . ."). If the arrow is double (⇔), the statement is reversible.
	Definition ***Congruent polygons*** ⇔ all pairs of corresponding parts are congruent.
	Postulate ***Any segment or angle is congruent to itself. (Reflexive Property)***
3.2	**Postulate** ***If there exists a correspondence between the vertices of two triangles such that three sides of one triangle are congruent to the corresponding sides of the other triangle, the two triangles are congruent. (SSS)***
	Postulate ***If there exists a correspondence between the vertices of two triangles such that two sides and the included angle of one triangle are congruent to the corresponding parts of the other triangle, the two triangles are congruent. (SAS)***
	Postulate ***If there exists a correspondence between the vertices of two triangles such that two angles and the included side of one triangle are congruent to the corresponding parts of the other triangle, the two triangles are congruent. (ASA)***

3.3	**CPCTC** In the portions of the book that follow, we shall often draw such a conclusion *after* knowing that some triangles are congruent. We shall use CPCTC as the reason. CPCTC is short for "*Corresponding Parts of Congruent Triangles are Congruent.*" By corresponding parts, we shall mean only the matching angles and sides of the respective triangles.
	Theorem 19 ***All radii of a circle are congruent.*** (You do not need to attempt a proof of this theorem.)
3.4	**Definition** A ***median*** of a triangle is a line segment drawn from any vertex of the triangle to the midpoint of the opposite side. (A median divides into two congruent segments, or bisects the side to which it is drawn.)
	Definition An ***altitude*** of a triangle is a line segment drawn from any vertex of the triangle to the opposite side, extended if necessary, and perpendicular to that side. (An altitude of a triangle forms right [90°] angles with one of the sides.)
	Postulate ***Two points determine a line (or ray or segment).*** **Auxiliary Lines** (2 pts ⇒seg.)
3.5	none
3.6	**Definition** A ***scalene triangle*** is a triangle in which no two sides are congruent.
	Definition An ***isosceles triangle*** is a triangle in which at least two sides are congruent.
	Definition An ***equilateral triangle*** is a triangle in which all sides are congruent.

	Definition	An ***equiangular triangle*** is a triangle in which all angles are congruent.
	Definition	An ***acute triangle*** is a triangle in which all angles are acute.
	Definition	A ***right triangle*** is a triangle in which one of the angles is a right angle. (The side opposite the right angle is called the ***hypotenuse.*** The sides that form the right angle are called ***legs.***)
	Definition	An ***obtuse triangle*** is a triangle in which one of th angles is an obtuse angle.
3.7	**Theorem 20**	***If two sides of a triangle are congruent, the angles opposite the sides are congruent. (If △, then △.)***

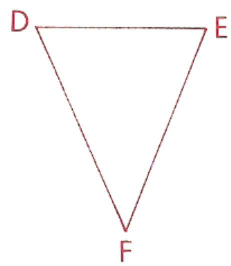
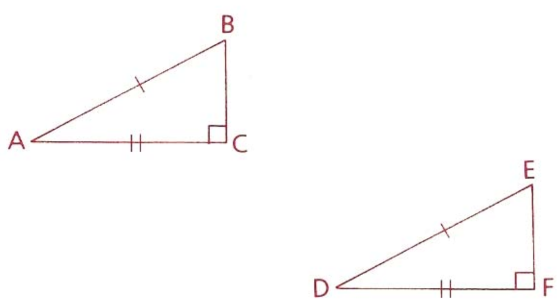
Given: $\overline{AB} \cong \overline{AC}$

Prove: $\angle B \cong \angle C$



Proof:

Statements	Reasons
1 $\overline{AB} \cong \overline{AC}$	1
2 $\overline{BC} \cong \overline{BC}$	2
3 $\triangle ABC \cong \triangle ACB$	3
4 $\angle B \cong \angle C$	4

	Theorem 21 *If two angles of a triangle are congruent, the sides opposite the angles are congruent. (If △, then △.)* Given: $\angle D \cong \angle E$ Conclusion: $\overline{DF} \cong \overline{EF}$  Proof: Statements | Reasons 1 $\angle D \cong \angle E$ | 1 2 $\overline{DE} \cong \overline{DE}$ | 2 3 $\triangle DEF \cong \triangle EDF$ | 3 4 $\overline{DF} \cong \overline{EF}$ | 4
	No need to prove these theorems. Also, we will not use them in proofs. You should, however, understand them. **Theorem** *If two sides of a triangle are not congruent, then the angles opposite them are not congruent, and the larger angle is opposite the longer side. (If △, then △.)* **Theorem** *If two angles of a triangle are not congruent, then the sides opposite them are not congruent, and the longer side is opposite the larger angle. (If △, then △.)*
3.8	 **Postulate** *If there exists a correspondence between the vertices of two right triangles such that the hypotenuse and a leg of one triangle are congruent to the corresponding parts of the other triangle, the two right triangles are congruent. (HL)*