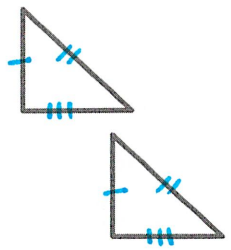
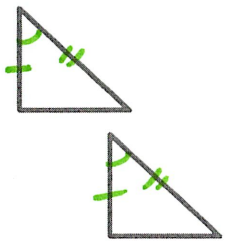
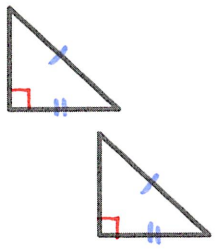
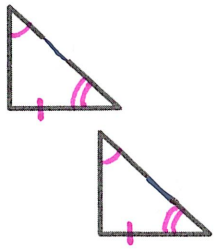
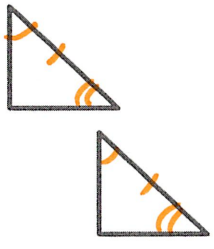
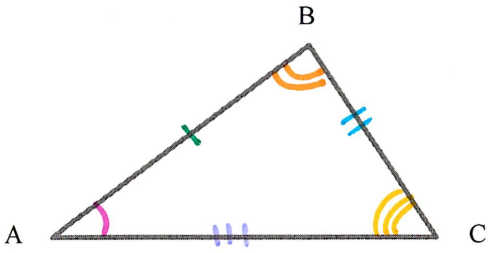
Chapter 4.6: Use Congruent Triangles

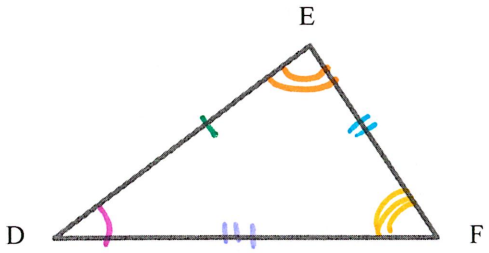
Review:

Triangle Congruence Postulates and Theorems				
SSS	SAS	HL	AAS	ASA
3 corresponding Congruent sides	Side ≅ Angle (included) Side ≅	Right Triangle Hypotenuse ≅ 1 Leg ≅	Angle ≅ Angle ≅ Side ≅ (Not included)	Angle ≅ Side ≅ (included) Angle
				

By definition (from section 2):

Corresponding Parts of Congruent Triangles are Congruent





Congruence Statement: $\triangle ABC \cong \triangle DEF$ because of this you know...

$\angle A \cong \angle D$ $\quad \overline{AB} \cong \overline{DE}$

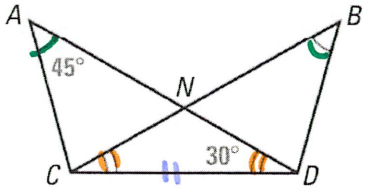
$\angle B \cong \angle E$ $\quad \overline{BC} \cong \overline{EF}$

$\angle C \cong \angle F$ $\quad \overline{CA} \cong \overline{FD}$

IMPORTANT!! Before we can prove corresponding sides or angles are congruent, we MUST prove that the triangles are congruent using

SSS, SAS, HL, AAS, ASA,

Example #1: $\triangle ADC \cong \triangle BCD$ by AAS. What other parts of the triangles are congruent by CPCTC??



$\angle A \cong \angle B$

$\angle ADC \cong \angle BCD$

$\overline{CD} \cong \overline{DC}$

$\angle BDC \cong \angle ACD$

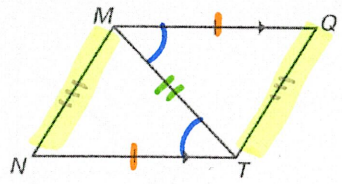
$\overline{BC} \cong \overline{AD}$

$\overline{BD} \cong \overline{AC}$

Example #2: Prove.

Given:

Prove: $\overline{MN} \cong \overline{TQ}$

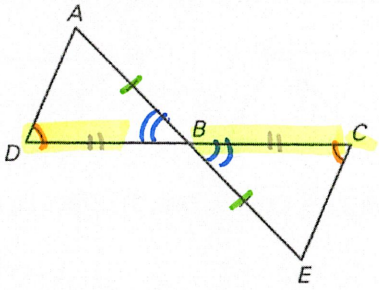


Statement	Reason
1. S: $\overline{MQ} \cong \overline{TN}$	1. Given
2. $\overline{MQ} \parallel \overline{TN}$	2. Given
3. A: $\angle QMT \cong \angle NTM$	3. Alternate Interior Angles
4. S: $\overline{MT} \cong \overline{TM}$	4. Reflexive Property
5. $\triangle QMT \cong \triangle NTM$	5. SAS
6. $\overline{MN} \cong \overline{TQ}$	6. CPCTC

Example #3: Prove.

Given:

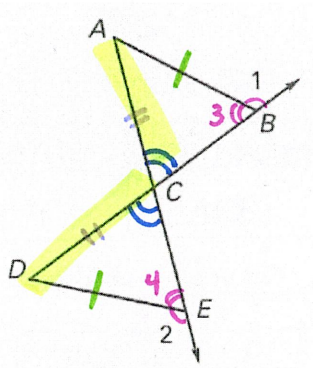
Prove: $\overline{DB} \cong \overline{CB}$



Statement	Reason
1. A: $\angle D \cong \angle C$	1. Given
2. S: $\overline{AB} \cong \overline{EB}$	2. Given
3. A: $\angle ABD \cong \angle EBC$	3. Vertical Angles
4. $\triangle ABD \cong \triangle EBC$	4. AAS
5. $\overline{DB} \cong \overline{CB}$	5. CPCTC

Example #4: Prove.

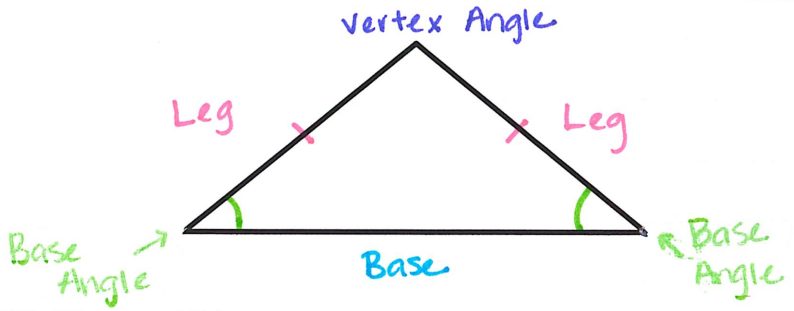
Given: $\angle 1 \cong \angle 2, \overline{AB} \cong \overline{DE}$
Prove: $\overline{DC} \cong \overline{AC}$



Statement	Reason
1. $\angle 1 \cong \angle 2$	1. Given
2. $\angle 1$ and $\angle 3$, $\angle 2$ and $\angle 4$ are supplementary angles	2. Def^n of Supplementary Angles
3. A: $\angle 3 \cong \angle 4$	3. Congruent supplements Th^{rm}
4. S: $\overline{AB} \cong \overline{DE}$	4. Given
5. A: $\angle ACB \cong \angle DCE$	5. Vertical Angles
6. $\triangle ACB \cong \triangle DCE$	6. AAS
7. $\overline{DC} \cong \overline{AC}$	7. CPCTC

Chapter 4.7: Use Isosceles and Equilateral Triangles

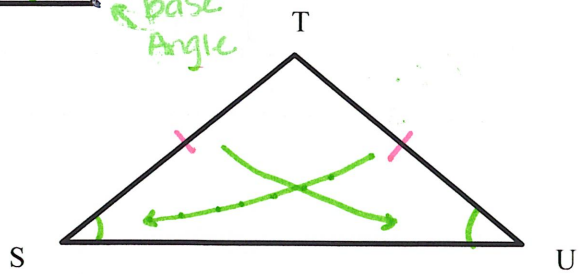
Isosceles Triangle:



Base Angles Theorem (Theorem 4.7):

If two sides (Legs) of a triangle are congruent, then the angles opposite them are congruent.

If $\overline{ST} \cong \overline{JT}$, then $\angle S \cong \angle U$



Converse of Base Angles Theorem (Theorem 4.8):

If two angles of a triangle are congruent, then the sides opposites them are congruent.