Geometry

Notes Section 4.2

Apply Congruence and Triangles
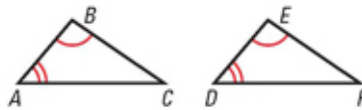
VOCABULARY

Congruent Figures: _____

_____

Corresponding Parts: _____

THEOREM 4.3 Third Angles Theorem

If two angles of one triangle are congruent to two angles of another triangle, then the third angles are also congruent.
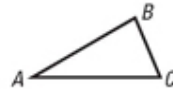
If $\angle A \cong \angle D$, and $\angle B \cong \angle E$, then $\angle C \cong \angle F$.

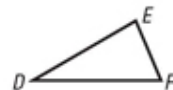**THEOREM 4.4 Properties of Congruent Triangles**

Reflexive Property of Congruent Triangles

For any triangle ABC, $\triangle ABC \cong \triangle ABC$.
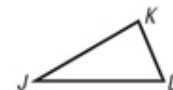
Symmetric Property of Congruent Triangles

If $\triangle ABC \cong \triangle DEF$, then $\triangle DEF \cong \triangle ABC$.

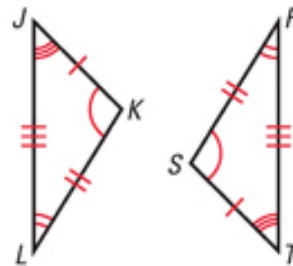**Transitive Property of Congruent Triangles**

If $\triangle ABC \cong \triangle DEF$ and $\triangle DEF \cong \triangle JKL$, then $\triangle ABC \cong \triangle JKL$.

EXAMPLE 1   Write a congruence statement and identify all congruent corresponding parts.
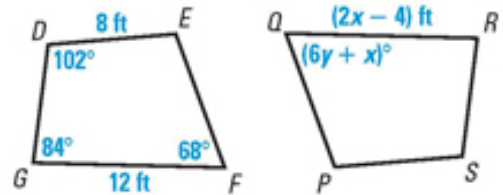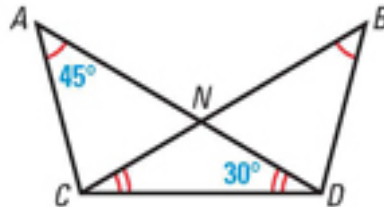
Angles   **Sides**

_____   _____

_____   _____

_____   _____

Congruence Statement: _____

EXAMPLE 2   DEFG≅SPQR. Find x and y.

D 8 ft E   Q (2x − 4) ft R
102°   (6y + x)°
84°   68°
G 12 ft F   P   S

EXAMPLE 3   Find m∠BDC.

A   B
45°
N
30°
C   D

EXAMPLE 4   Complete the following proofs.

a) Given: AD≅CB, DC≅BA

A
D
B
C

∠ACD≅∠CAB, ∠CAD≅∠ACB

Prove: ΔACD≅ΔCAB
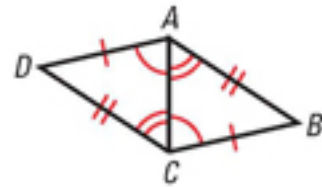
1. AD≅CB, DC≅BA   1. _____

2. AC≅AC   2. _____

3. ∠ACD≅∠CAB, ∠CAD≅∠ACB   3. _____

4. ∠B≅∠D   4. _____

5. ΔACD≅ΔCAB   5. _____

b) Given: SV≅RV, TV≅WV, ST≅RW

∠T≅∠W

Prove: ΔSTV≅ΔRWV

1. **SV≅RV, TV≅WV, ST≅RW**

2. **∠T≅∠W**

3. **∠SVT≅∠RVW**

4. **∠S≅∠R**

5. **ΔSTV≅ΔRWV**

1. _____

2. _____

3. _____

4. _____

5. _____

S   T

V

W   R