Warm up

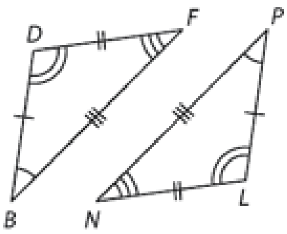
If $\triangle AHR \cong \triangle KDT$ which sides and angles are congruent?

Example: <A is congruent to <K

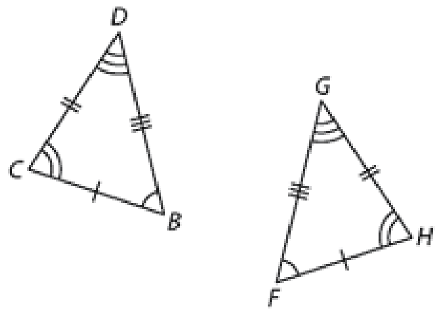
$\angle A \cong \angle K$	$\overline{HR} \cong \overline{DT}$
$\angle H \cong \angle D$	$\overline{AR} \cong \overline{KT}$
$\angle R \cong \angle T$	$\overline{AH} \cong \overline{KD}$

1-2. Use the diagrams to create a congruence statement for each set of congruent triangles.

1.



2.



$\Delta BDF \cong \Delta PLN$

$\Delta DFB \cong \Delta LNP$

$\Delta FBD \cong \Delta NPL$

$\Delta DCB \cong \Delta GHF$

$\Delta CBD \cong \Delta HFG$

$\Delta BDC \cong \Delta FGH$

3-5. Name the corresponding angles and sides for each pair of congruent triangles.

3. $\Delta QRS \cong \Delta WXY$

$\angle Q \cong \angle W$

$\angle R \cong \angle X$

$\angle S \cong \angle Y$

$\overline{QR} \cong \overline{WX}$

$\overline{RS} \cong \overline{XY}$

$\overline{QS} \cong \overline{WY}$

4. $\Delta AFH \cong \Delta CGJ$

$\angle A \cong \angle C$

$\angle F \cong \angle G$

$\angle H \cong \angle J$

$\overline{AF} \cong \overline{CG}$

$\overline{AH} \cong \overline{CJ}$

$\overline{FH} \cong \overline{GJ}$

5. Suppose $\Delta ABC \cong \Delta EFG$. For each of the following, name the corresponding p

a. $\angle A$ $\angle E$

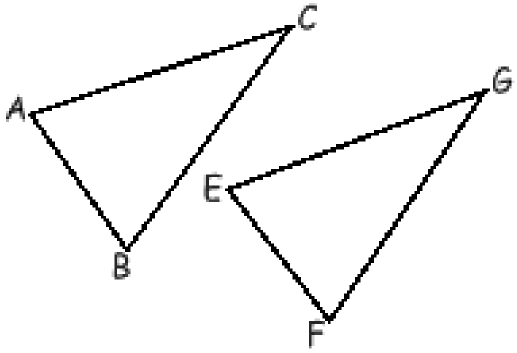
b. $\angle BCA$ $\angle FGE$

c. $\overline{AC}$ $\overline{EG}$

d. $\angle F$ $\angle B$

e. $\angle GEF$ $\angle CAB$

f. $\overline{GE}$ $\overline{CA}$



Need help

0-6 points	3 yellow 2 Blue
7-14	3 Blue 2 Green
15-20	2 Blue 4 Green

Yellow

Blue

Green

Triangle Congruency Book

Reason

Side-Side-Side Congruence (SSS)	If three sides of a triangle are congruent to three sides of another triangle, then the triangles are congruent.
Side-Angle-Side Congruence (SAS)	If two sides and the included angle of a triangle are congruent to two sides and the included angle of another triangle, then the triangles are congruent.
Angle-Side-Angle Congruence (ASA)	If two angles and the included side of a triangle are congruent to two angles and the included side of another triangle, then the triangles are congruent.
Angle-Angle-Side Congruence (AAS)	If two angles and a non-included side of a triangle are congruent to two angles and the corresponding non-included side of another triangle, then the triangles are congruent.
Hypotenuse-Leg Congruence (HL)	If the hypotenuse and a leg of one right triangle are congruent to the hypotenuse and a leg of another right triangle, then the triangles are congruent.
CPCTC	Corresponding parts of congruent triangles are congruent.

$\triangle\_\_ \cong \triangle\_\_$ SSS, SAS, ASA, AAS, HL

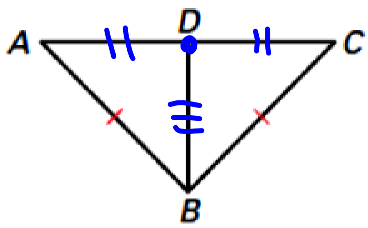
Statement Reason

After

Corresponding parts of $\cong$ $\triangle$s are $\cong$

PROOF #1

Proof Copy and complete the proof.



GIVEN: $\overline{AB} \cong \overline{CB}$, D is the midpoint of $\overline{AC}$.

PROVE: $\triangle ABD \cong \triangle CBD$

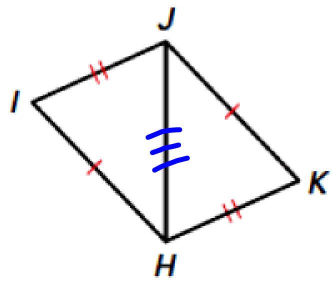
Statements	**Reasons**
1. $\overline{AB} \cong \overline{CB}$	**1.** ? Given
2. D is the midpoint of $\overline{AC}$.	**2.** ? Given
3. $\overline{AD} \cong \overline{CD}$	**3.** ? Def. of midpoint
4. $\overline{BD} \cong \overline{BD}$	**4.** ? Reflexive
5. $\triangle ABD \cong \triangle CBD$	**5.** ? SSS

PROOF #2

Proof Copy and complete the proof.

GIVEN: $\overline{HI} \cong \overline{JK}$,
$\overline{IJ} \cong \overline{KH}$

PROVE: $\triangle HIJ \cong \triangle JKH$



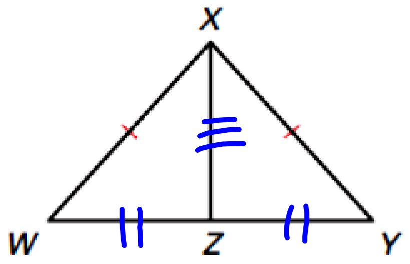
Statements	Reasons
1. ? $\overline{HI} \cong \overline{JK}$	1. Given
2. ? $\overline{IJ} \cong \overline{KH}$	2. Given
3. ? $\overline{JH} \cong \overline{JH}$	3. Reflexive Property of Congruence
4. ? $\triangle HIJ \cong \triangle JKH$	4. SSS Congruence Postulate

PROOF #3

Proof Copy and complete the proof.

GIVEN: $\overline{WX} \cong \overline{YX}$,
Z is the midpoint of $\overline{WY}$.

PROVE: $\triangle WXZ \cong \triangle YXZ$



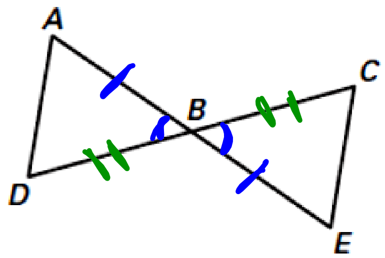
Statements	Reasons
1. ? $\overline{WX} \cong \overline{YX}$	1. Given
2. ? Z is the midpoint	2. Given
3. ? $\overline{WZ} \cong \overline{YZ}$	3. Definition of Midpoint
4. ? $\overline{XZ} \cong \overline{XZ}$	4. Reflexive Property of Congruence
5. ? $\triangle WXZ \cong \triangle YXZ$	5. SSS Congruence Postulate

PROOF #4

Proof Copy and complete the proof.

GIVEN: B is the midpoint of $\overline{AE}$.
B is the midpoint of $\overline{CD}$.

PROVE: $\triangle ABD \cong \triangle EBC$



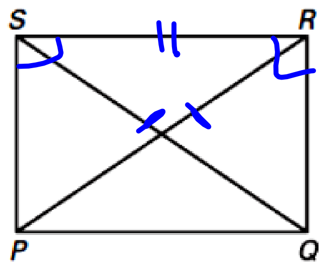
Statements	Reasons
1. B is the midpoint of $\overline{AE}$.	**1.** ? Given
2. ? $\overline{AB} \cong \overline{EB}$	**2.** Definition of midpoint
3. B is the midpoint of $\overline{CD}$.	**3.** ? Given
4. ? $\overline{DB} \cong \overline{CB}$	**4.** Definition of midpoint
5. $\angle ABD \cong \angle EBC$	**5.** ? vert ∠s are ≅
6. $\triangle ABD \cong \triangle EBC$	**6.** ? SAS

PROOF #5

Proof Copy and complete the proof.

GIVEN: $\overline{QS} \cong \overline{PR}$, $\overline{PS} \perp \overline{RS}$, $\overline{QR} \perp \overline{RS}$

PROVE: $\triangle PRS \cong \triangle QSR$



Statements	Reasons
1. $\overline{QS} \cong \overline{PR}$	1. Given
2. $\overline{PS} \perp \overline{RS}$, $\overline{QR} \perp \overline{RS}$	2. Given
3. $\angle S$ and $\angle R$ are right angles.	3. ? Def. of $\perp$
4. ? $m\angle S = 90°$ $m\angle R = 90°$	4. Definition of a right triangle
5. $\overline{RS} \cong \overline{SR}$	5. ? Reflexive
6. $\triangle PRS \cong \triangle QSR$	6. ? HL

Properties of Congruence	
Reflexive Property	$\overline{AB} \cong \overline{AB}$; $\angle A \cong \angle A$
Symmetric Property	If $\overline{AB} \cong \overline{CD}$, then $\overline{CD} \cong \overline{AB}$. If $\angle A \cong \angle B$, then $\angle B \cong \angle A$.
Transitive Property	If $\overline{AB} \cong \overline{CD}$ and $\overline{CD} \cong \overline{EF}$, then $\overline{AB} \cong \overline{EF}$. If $\angle A \cong \angle B$ and $\angle B \cong \angle C$, then $\angle A \cong \angle C$.
Addition Postulates	
Segment Addition Postulate	If three points A, B, and C are collinear and B is between A and C, then $AB + BC = AC$.
Angle Addition Postulate	If point B is in the interior of $\angle AOC$, then $m\angle AOB + m\angle BOC = m\angle AOC$.
Angles	
Congruent Supplements Theorem	If two angles are supplementary to the same angle, then the two angles are congruent.
Congruent Complements Theorem	If two angles are complementary to the same angle, then the two angles are congruent.
Linear Pair Postulate	If two angles form a linear pair, then they are supplementary.
Right Angle Congruence Theorem	All right angles are congruent.
Vertical Angle Theorem	Vertical angles are congruent.

Parallel Lines	
Corresponding Angles Postulate	If two parallel lines are cut by a transversal, then the corresponding angles formed by the transversal are congruent.
Converse of Corresponding Angles Postulate	If two lines are cut by a transversal so that the corresponding angles formed by the transversal are congruent, then the lines are parallel.
Alternate Interior Angles Theorem	If two parallel lines are cut by a transversal, then the alternate interior angles formed by the transversal are congruent.
Converse of Alternate Interior Angles Theorem	If two lines are cut by a transversal so that the alternate interior angles formed by the transversal are congruent, then the lines are parallel.
Same-Side Interior Angles Theorem	If two parallel lines are cut by a transversal, then the same-side interior angles formed by the transversal are supplementary.
Converse of Same-Side Interior Angles Theorem	If two lines are cut by a transversal so that the same-side interior angles formed by the transversal are supplementary, then the lines are parallel.