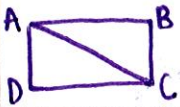







Name: \_\_\_\_\_ Date: \_\_\_\_\_

### Day 4 – Triangle Proofs

- Two-column geometric proofs are essentially just tables with statements on the left and a reasons on the right.
- The statements we make are going to be the Steps we take toward solving our problem.
- Reasons can consist of information given within the problem itself, definitions, postulates or theorems.

If...	Then the reason is...
an angle or side is ALREADY marked on the picture, or if it is given in the directions,	given
the shapes share a side  $\overline{AC} \cong \overline{AC}$	reflexive property
parallel lines create alternate interior angles  $\angle BAC \cong \angle DCA$	alt. int. $\angle$ 's are congruent alt. int. $\angle$ s congruence postulate
you see vertical angles  $\angle ACB \cong \angle ECD$	vertical $\angle$ s are $\cong$
one of the points is a midpoint of a line segment  $\overline{CP} \cong \overline{BP}$	definition of a midpoint
A line segment bisects a side  $\overline{CO} \cong \overline{BO}$	definition of a bisector
A line segment bisects an angle  $\angle CAO \cong \angle BAO$	definition of an angle bisector
the statement states that the triangles are congruent,	SSS, SAS, ASA, AAS, HL
the triangles have already been proven to be congruent, and now we are trying to prove a side or angle is congruent,	CPCTC

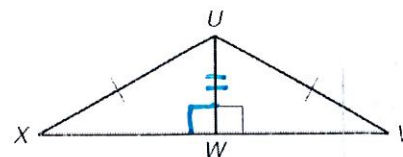
Don't forget to ALWAYS mark your pictures!

Complete the following proofs:

Practice #1:

Given:  $\triangle UXW$  and  $\triangle UVW$  are right triangles,  $\overline{UX} \cong \overline{UV}$

Prove:  $\angle X \cong \angle V$

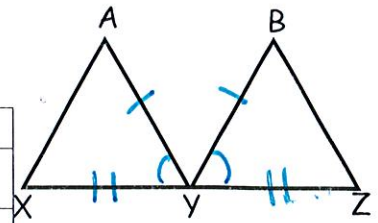


Statements	Reasons
1) $\triangle UXW$ and $\triangle UVW$ are rt. triangles	given
2) $\overline{UX} \cong \overline{UV}$	given
3) $\overline{UW} \cong \overline{UW}$	reflexive property
4) $\triangle UXW \cong \triangle UVW$	HL congruence postulate
5) $\angle X \cong \angle V$	CPCTC

Practice #2:

Given: Y is the midpoint of  $\overline{XZ}$ ,  $\overline{AY} \cong \overline{BY}$ , and  $\angle AYX \cong \angle BYZ$ .

Prove:  $\triangle XYA \cong \triangle ZYB$

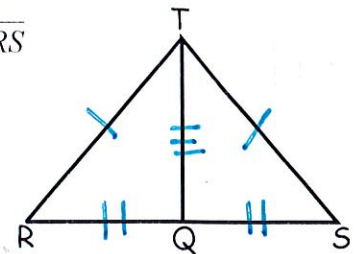


Statements	Reasons
1) $\overline{AY} \cong \overline{BY}$	given
2) $\angle AYX \cong \angle BYZ$	given
3) Y is the midpoint of $\overline{XZ}$	given
4) $\overline{XY} \cong \overline{YZ}$	definition of a midpoint
5) $\triangle XYA \cong \triangle ZYB$	SAS congruence postulate

Practice #3:

Given:  $\triangle RTS$  is isosceles with legs  $\overline{RT}$  and  $\overline{TS}$ . Q is the midpoint of  $\overline{RS}$

Prove:  $\triangle RTQ \cong \triangle STQ$

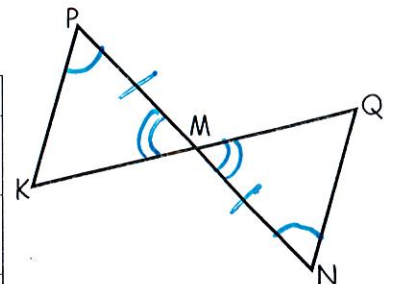


Statements	Reasons
1) $\triangle RTS$ is isos. w/ legs $\overline{RT}$ & $\overline{TS}$	given
2) $\overline{RT} \cong \overline{TS}$	definition of isos. $\triangle$
3) Q is the midpoint of $\overline{RS}$	given
4) $\overline{RQ} \cong \overline{SQ}$	definition of a midpoint
5) $\overline{TQ} \cong \overline{TQ}$	reflexive property
6) $\triangle RTQ \cong \triangle STQ$	SSS congruence postulate

Practice #4:

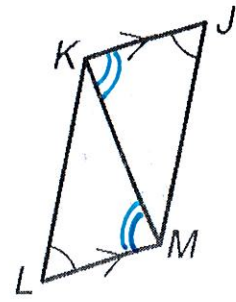
Given:  $\angle P \cong \angle N$ ,  $\overline{PM} \cong \overline{NM}$

Prove:  $\triangle PMK \cong \triangle NMQ$



Statements	Reasons
1) $\angle P \cong \angle N$	given
2) $\overline{PM} \cong \overline{NM}$	given
3) $\angle PMK \cong \angle NMQ$	vertical $\angle$ s are $\cong$
4) $\triangle PMK \cong \triangle NMQ$	ASA congruence postulate

## Practice #5:

Given:  $\angle L \cong \angle J, \overline{LM} \parallel \overline{KJ}$ Prove:  $\triangle LKM \cong \triangle JMK$ 

Statements	Reasons
1) $\angle L \cong \angle J$	given
2) $\overline{LM} \parallel \overline{KJ}$	given
3) $\angle KML \cong \angle MKJ$	Alt. Int $\angle$ s theorem
4) $\overline{MK} \cong \overline{KM}$	Reflexive property
5) $\triangle LKM \cong \triangle JMK$	AAS congruence postulate