Do Now:

1) Write the definition of the word midpoint: a midpoint a point on the middle ~~line~~ segment of a line that cuts the line into two ~~equal halves~~. congruent segments

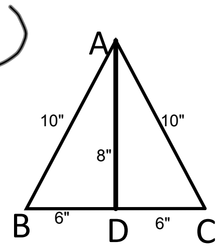
- Agenda:
- Reflexive Property of Congruence
- Triangle Congruence
- SSS Postulate

Try the following:

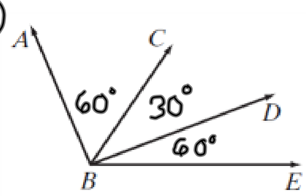
(1) $\overline{AB} \cong \overline{AC}$, $\overline{BD} \cong \overline{DC}$, $\overline{AD} \cong \overline{AD}$

(2) <ABC $\cong$ <EBD
<CBD $\cong \angle \underline{CBD}$

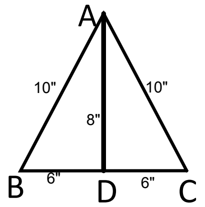
(1)



(2)



Reflexive Property of Congruence: A quantity is equal to itself.



Given: diagram
Prove: $\overline{AD} \cong \overline{AD}$

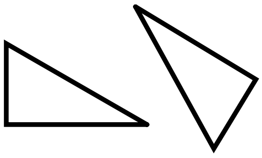
$\xrightarrow[\text{congruence}]{\text{reflexive property of}}$ $\boxed{\overline{AD} \cong \overline{AD}}$

Given: $\overline{ABCD}$
Prove: $\overline{BC} \cong \overline{BC}$

$\xrightarrow[\text{congruence}]{\text{reflexive property of}}$ $\boxed{\overline{BC} \cong \overline{BC}}$

Congruent Triangles

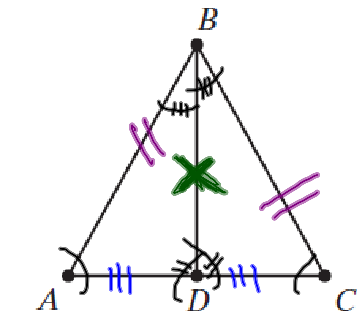
- Triangles that are <u>the same size and shape</u> are called <u>congruent triangles</u>.
- Each pair of sides will <u>have the same length</u>.
- Each pair of angles will <u>have the same measure</u>.



Definitions:

- corresponding parts – angles and sides that are in the same location in a pair of figures.

- congruent triangles - triangles whose corresponding angles and sides are congruent.



$\triangle ABD \cong \triangle CBD$. Name the three corresponding sides and three corresponding angles.

$\triangle ABD \cong \triangle CBD$

$\overline{AB} \cong \overline{CB}$

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

$\overline{AD} \cong \overline{CD}$

$\angle BAD \cong \angle BCD$

$\angle ABD \cong \angle CBD$

$\angle BDA \cong \angle BDC$

Side-Side-Side Postulate

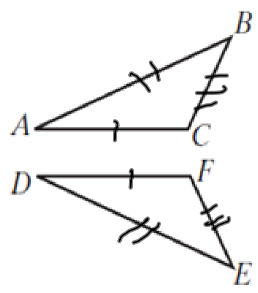
3) One method of proving triangles congruent is called the "Side Side Side" postulate.

In a proof, if you can show 3 pairs of corresponding sides are congruent, then you can conclude that the triangles are congruent.

Example Triangle Proof

Given: $\overline{AB} \cong \overline{DE}$, $\overline{AC} \cong \overline{DF}$, $\overline{BC} \cong \overline{FE}$

Prove: $\Delta ABC \cong \Delta DEF$



given → $\boxed{\overline{AB} \cong \overline{DE}}$ → S

Given → $\boxed{\overline{AC} \cong \overline{DF}}$ → S

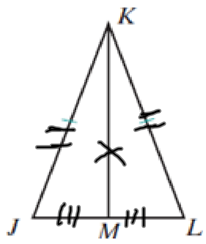
given → $\boxed{\overline{BC} \cong \overline{EF}}$ → S

$\boxed{\Delta ABC \cong \Delta DEF}$

SSS ≅ SSS

Given: ~~Isosceles $\triangle JKL$~~ with $\overline{JK} \cong \overline{KL}$ and M the midpoint of $\overline{JL}$, $\overline{KM} \cong \overline{KM}$

Prove: $\triangle JKM \cong \triangle LKM$



Proof Prove the triangles congruent by using SSS.

given → $\overline{JK} \cong \overline{KL}$ → S

given → M is the midpoint of $\overline{JL}$ $\xrightarrow{\text{a midpoint divides a segment into 2 } \cong \text{ segment}}$ $\overline{JM} \cong \overline{ML}$ → S

reflexive property of congruence → $\overline{KM} \cong \overline{KM}$ → S

→ $\triangle JKM \cong \triangle LKM$

SSS ≅ SSS

Key Ideas

- What do we mean by congruent triangles?

- If two triangles are congruent, then all three pairs of corresponding sides are congruent.
- Is the converse of this statement true?

- Corresponding vs. Congruent