

Name: Kelly

Date: _____

UNIT 3

LESSON 3

AIM: WHAT ARE THE SAS AND AAS SHORTCUTS TO PROVE TRIANGLES ARE CONGRUENT?

Do Now: In the diagram below, $\triangle ABC \cong \triangle XYZ$.

Which two statements identify corresponding congruent parts for these triangles?

~~1) $\overline{AB} \cong \overline{XY}$ and $\angle C \cong \angle Y$~~

~~2) $\overline{AB} \cong \overline{YZ}$ and $\angle C \cong \angle X$~~

~~3) $\overline{BC} \cong \overline{XY}$ and $\angle A \cong \angle Y$~~

4) $\overline{BC} \cong \overline{YZ}$ and $\angle A \cong \angle X$

$\overline{AB} \cong \overline{XY}$

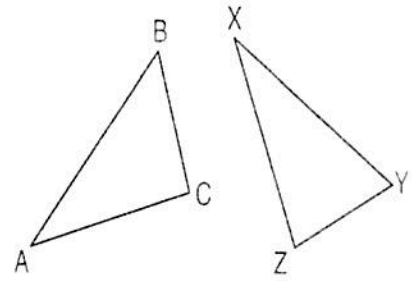
$\angle A \cong \angle X$

$\overline{BC} \cong \overline{YZ}$

$\angle B \cong \angle Y$

$\overline{AC} \cong \overline{XZ}$

$\angle C \cong \angle Z$

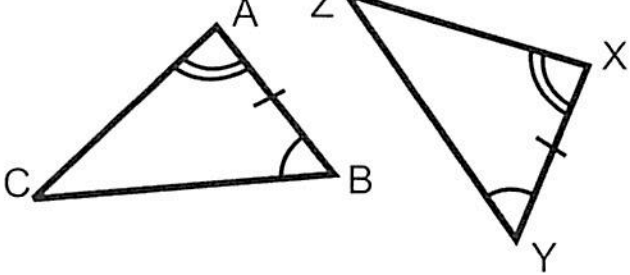
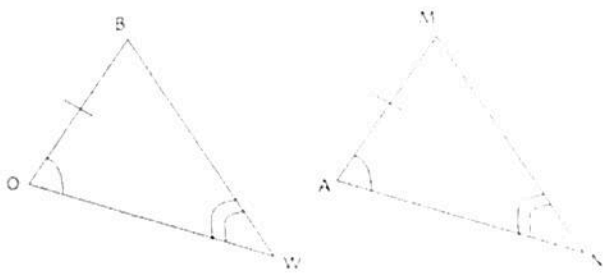


So far, we have learned three shortcuts to prove triangles are congruent without knowing all sides and angles:

SSS, SAS and HL.

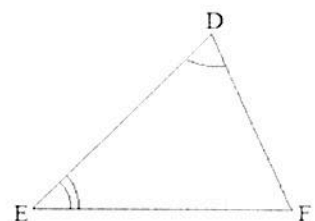
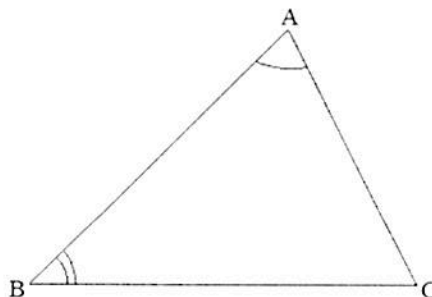
We have also learned that SSA can NOT be used to prove triangles are congruent.

BUT WAIT...THERE ARE TWO MORE!

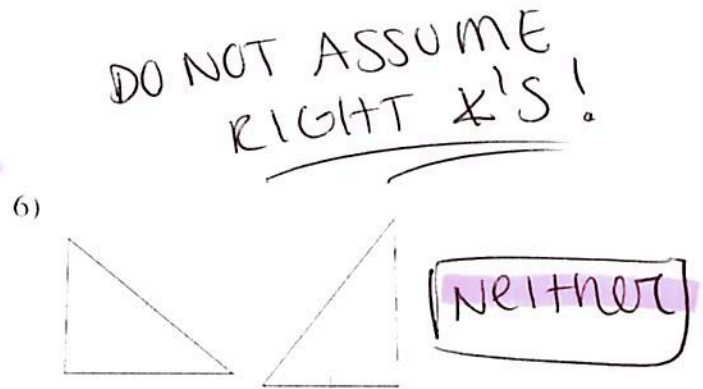
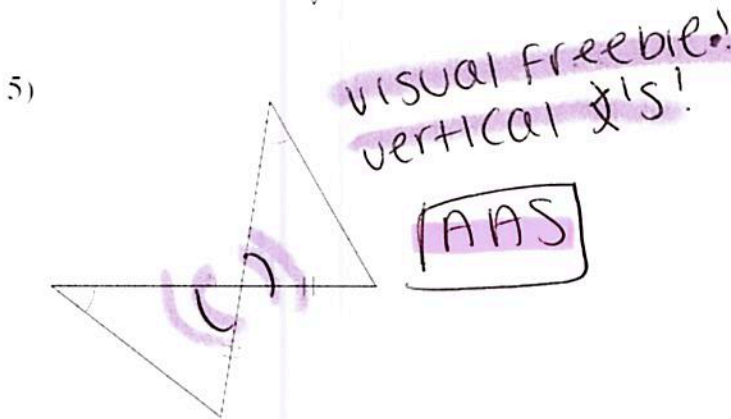
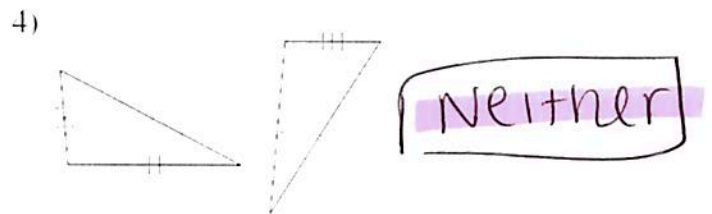
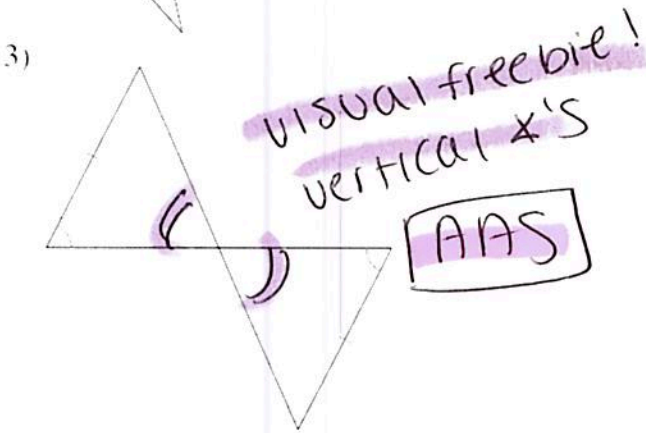
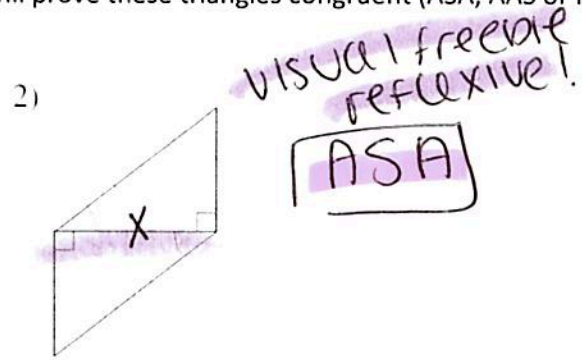
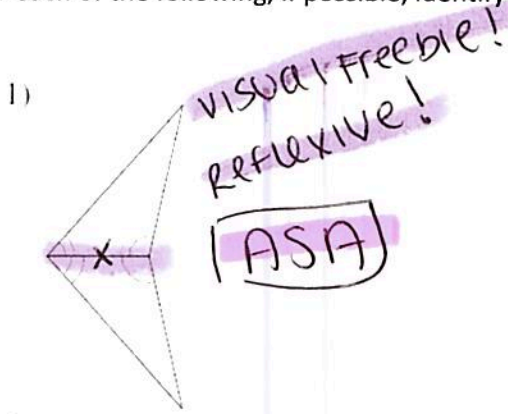
ASA (Angle-Side-Angle)	AAS (Angle-Angle-Side)
 <p>*The side MUST be included between the two sides*</p>	 <p>*The side is NOT included between the two angles*</p>

BEWARE! There is also one more that does NOT work... AAA. **WHY?!**

Angles can remain congruent while side lengths can change!



For each of the following, if possible, identify which postulate will prove these triangles congruent (ASA, AAS or Neither)



DO NOT ASSUME
RIGHT X'S!

Based on the given information, determine what shortcut should be used and write a plan on how you would prove the triangles congruent.

6. Given: M is the midpoint of \overline{HP} , $\angle H \cong \angle P$

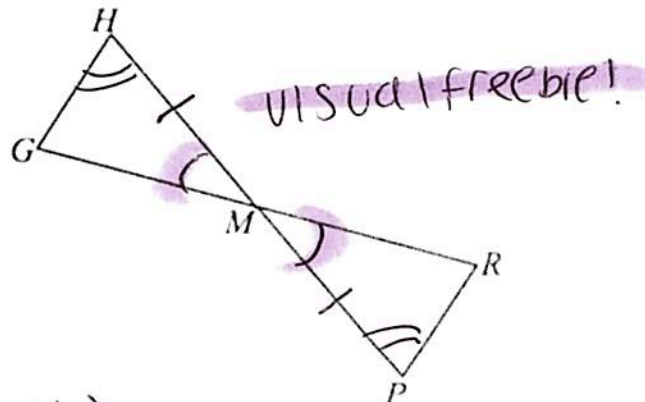
Prove: $\triangle GHM \cong \triangle RPM$

PLAN: ASA!

(A) $\angle H \cong \angle P$ (given)

(S) $\overline{HM} \cong \overline{MP}$ (midpoint)

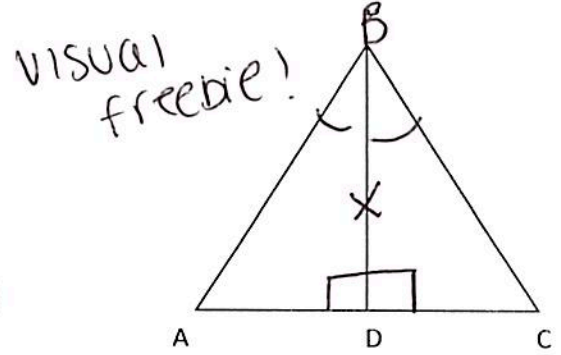
(A) $\angle HMG \cong \angle PMR$ (vertical \angle 's)



7. Given: \overline{BD} bisects $\angle ABC$, $\overline{BD} \perp \overline{AC}$
 Prove: $\triangle ABD \cong \triangle CBD$

PLAN: ASA

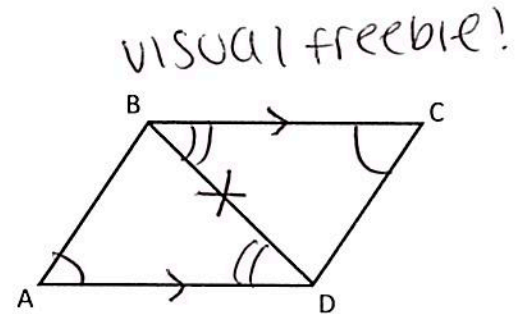
- (A) $\angle ABD \cong \angle CBD$ (bisector)
- (S) $\overline{BD} \cong \overline{BD}$ (reflexive)
- (A) $\angle ADB \cong \angle CDB$ (\cong right \angle 's)



8. Given: $\overline{BC} \parallel \overline{AD}$ and $\angle A \cong \angle C$
 Prove: $\triangle ABD \cong \triangle CDB$

PLAN: AAS

- (A) $\angle A \cong \angle C$ (given)
- (A) $\angle ADB \cong \angle CBD$ (alt. int. \angle 's)
- (S) $\overline{BD} \cong \overline{BD}$ (reflexive)



SUMMARY:

- To prove triangles are congruent, you need at least 3 pieces of information.
- The five "short cuts" to prove triangles are congruent are:

- SAS
- SSS
- HL
- ASA
- AAS

- Steps to proving triangles are congruent:

- Mark the diagram with given information.
- Look for visual freebies (vertical \angle 's and reflexive)
- Identify SHORTCUT
- Write plan!

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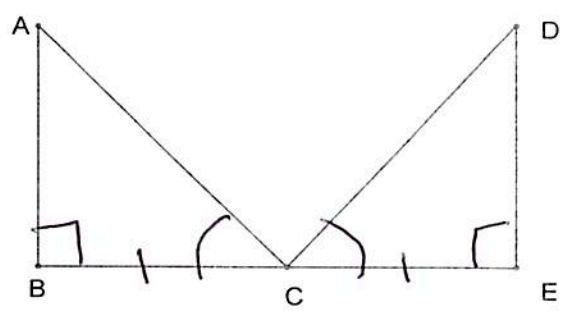
UNIT 3

LESSON 3

HOMEWORK

1. Using the given information, determine the shortcut used and write a plan

Given: $\angle ACB \cong \angle DCE$ $\overline{AB} \perp \overline{BE}$, $\overline{DE} \perp \overline{BE}$ C is the midpoint of \overline{BE}
Prove: $\triangle ABC \cong \triangle DEC$



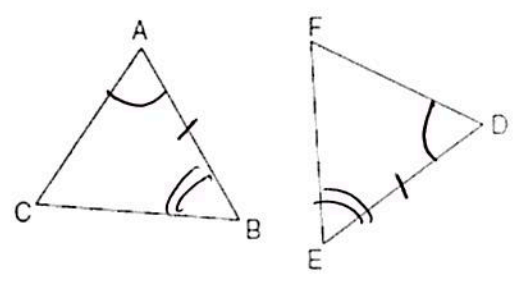
PLAN: (A) $\angle B \cong \angle E$ (\cong right \angle 's)
(S) $\overline{BC} \cong \overline{CE}$ (midpoint)
(A) $\angle ACB \cong \angle DCE$ (given)

2. In the diagram of $\triangle ABC$ and $\triangle DEF$ below, $\overline{AB} \cong \overline{DE}$, $\angle A \cong \angle D$, and $\angle B \cong \angle E$.

Which method can be used to prove $\triangle ABC \cong \triangle DEF$?

- 1) SSS
- 2) SAS
- (3) ASA
- 4) HL

mark diagram!

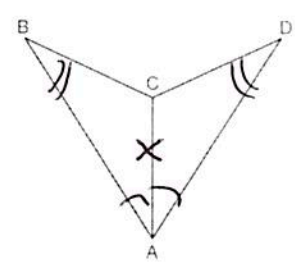


3. As shown in the diagram below, \overline{AC} bisects $\angle BAD$ and $\angle B \cong \angle D$.

Which method could be used to prove $\triangle ABC \cong \triangle ADC$?

- 1) SSS
- 2) AAA
- 3) SAS
- (4) AAS

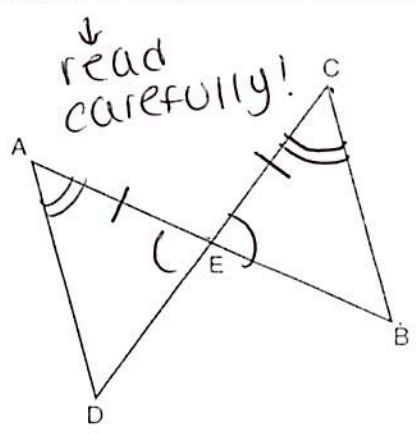
mark diagram!



4. In the diagram below of $\triangle DAE$ and $\triangle BCE$, \overline{AB} and \overline{CD} intersect at E, such that $\overline{AE} \cong \overline{CE}$ and $\angle BCE \cong \angle DAE$.

Triangle DAE can be proved congruent to triangle BCE by

- (1) ASA
- 2) SAS
- 3) SSS
- 4) HL

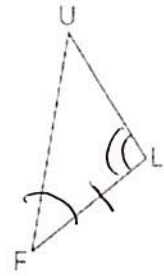
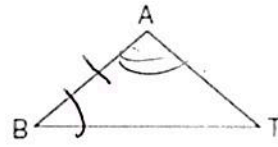


5. In the accompanying diagram of triangles BAT and FLU , $\angle B \cong \angle F$ and $\overline{BA} \cong \overline{FL}$.

Which statement is needed to prove $\triangle BAT \cong \triangle FLU$?

- 1) $\angle A \cong \angle L$
- 2) $\overline{AT} \cong \overline{LU}$
- 3) $\angle A \cong \angle U$
- 4) $\overline{BA} \parallel \overline{FL}$

ASA!



6. In the diagram below of $\triangle AGE$ and $\triangle OLD$, $\angle GAE \cong \angle LOD$, and $\overline{AE} \cong \overline{OD}$.

To prove that $\triangle AGE$ and $\triangle OLD$ are congruent by SAS, what other information is needed?

- 1) $\overline{GE} \cong \overline{LD}$
- 2) $\overline{AG} \cong \overline{OL}$
- 3) $\angle AGE \cong \angle OLD$
- 4) $\angle AEG \cong \angle ODL$

need side touching X!

