Geometry 4.5
Use the ASA postulate to test
congruence
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congruence
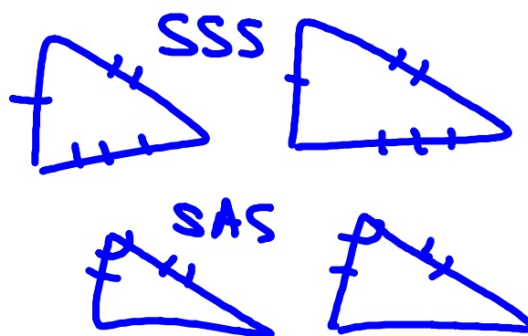included angle
included side

activity: exploragons
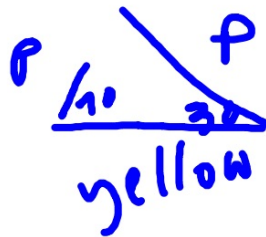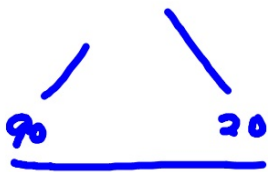construction ASA

Quiz 4.3-4.4 tomorrow

ASA Postulate
Use exploragons to create a 30 degree angle.
Make a 70 degree angle on the other end.
Write a sentence in your notes about your
observations.

P

P

70

30

90

30

yellow

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Postulate 4.3 Angle-Side-Angle (ASA) Congruence

If two angles and the included side of one triangle
are congruent to two angles and the included side of
another triangle, then the triangles are congruent.

Example If Angle $\angle A \cong \angle D$,

Side $\overline{AB} \cong \overline{DE}$, and

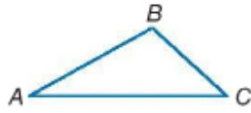Angle $\angle B \cong \angle E$,

then $\triangle ABC \cong \triangle DEF$.
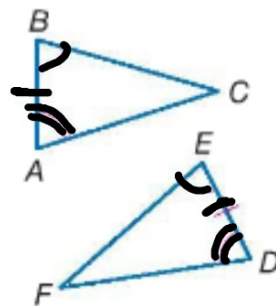
ASA (in that order)

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Draw a triangle and label it △*ABC*. Then use the
ASA Postulate to construct △*XYZ* ≅ △*ABC*.

Step 1
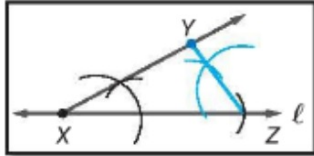
Draw a line ℓ and select a point
X. Construct $\overline{XZ}$ such that
$\overline{XZ} \cong \overline{AC}$.

Step 2

Construct an angle congruent to
∠*A* at *X* using $\overleftrightarrow{XZ}$ as a side of
the angle.

Step 3

Construct an angle congruent to
∠*C* at *Z* using $\overleftrightarrow{XZ}$ as a side of
the angle. Label the point where
the new sides of the angles
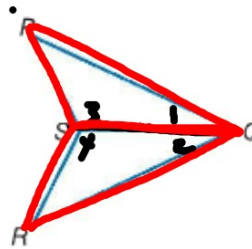meet as *Y*.

Example 1 Use ASA to Prove Triangles Congruent

Write a two-column proof.

Given: $\overline{QS}$ bisects $\angle PQR$;

$\angle P\mathbf{3}Q \cong \angle R\mathbf{4}Q$.

Prove: $\triangle PQS \cong \triangle RQS$
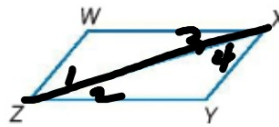
Proof:

Statements	Reasons
1. $\overline{QS}$ bisect $\angle PQR$ $\angle 3 \cong \angle 4$	1. given
2. $\overline{SQ} = \overline{SQ}$	2. reflex.
3. $\angle 1 \cong \angle 2$	3. def bisect
4. $\triangle PQS \cong \triangle RQS$	4. ASA

SSS
SAS
ASA

1. ~~Write a flow proof.~~

Given: $\overline{ZX}$ bisects $\angle WZY$; $\overline{XZ}$ bisects $\angle YXW$.

Prove: $\triangle WXZ \cong \triangle XZY$

|	
1. $\overline{ZX}$ bisects $\angle WZY$ $\overline{XZ}$ bisects $\angle YXW$	1. given
2. $\angle 1 \cong \angle 2$ $\angle 3 \cong \angle 4$	2. def. bisect
3. $\overline{ZX} \cong \overline{ZX}$	3. refl.
4. $\triangle WXZ \cong \triangle XZY$	4. A S A

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SSS
SAS
ASA
AAS

Theorem 4.5 Angle-Angle-Side (AAS) Congruence

If two angles and the nonincluded side of one triangle are congruent to the corresponding two angles and side of a second triangle, then the two triangles are congruent.

Example If Angle $\angle A \cong \angle D$,

Angle $\angle B \cong \angle E$, and

Side $\overline{BC} \cong \overline{EF}$,

then $\triangle ABC \cong \triangle DEF$.
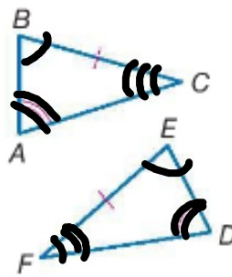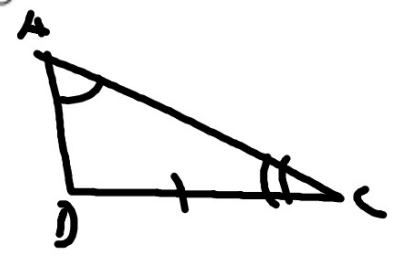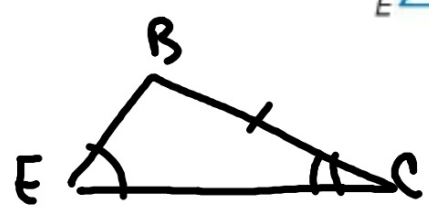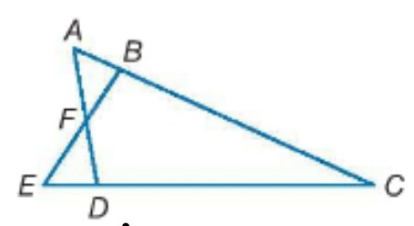
MUST be the corresponding side!

Example 2 Use AAS to Prove Triangles Congruent

Write a two-column proof.

Given: $\angle DAC \cong \angle BEC$ **A   e**

$\overline{DC} \cong \overline{BC}$

Prove: $\triangle ACD \cong \triangle ECB$
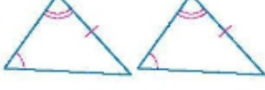
1. $\angle A \cong \angle E$ $\overline{DC} \cong \overline{BC}$	1. given
2. $\angle C \cong \angle C$	2. refl.
3. $\triangle ACD \cong \triangle ECB$	3. AAS

COMMUNITY SERVICE Jeremias is working with a community service group to build a bridge across a creek at a local park. The bridge will span the creek between points C and B. Jeremias located a fixed point D to use as a reference point so that the segments have the relationships shown. A is the midpoint of $\overline{CD}$ and DE is 15 feet. How long does the bridge need to be?

Start a new page: Triangle congruence page

Will record all triangle congruence postulates/theorems here. (Will be a dozen or so)

ConceptSummary Proving Triangles Congruent

SSS	SAS	ASA	AAS
Three pairs of corresponding sides are congruent.	Two pairs of corresponding sides and their included angles are congruent.	Two pairs of corresponding angles and their included sides are congruent.	Two pairs of corresponding angles and the corresponding nonincluded sides are congruent.