Name: ______________________________________ Per: _____

Determining Missing Information

Congruence and Similarity

As you know, there are 5 ways to prove that triangles are **congruent**:

SSS SAS ASA AAS HL

and 3 ways to prove that triangles are **similar:**

SSS SAS AA

You're not always given everything you need, though. Today, you're going to have triangle that *do not have enough information* to prove either congruence or similarity. Your job is going to be to determine **what else you would need** to show that the triangles are congruent or similar.

For example, if you have **AS**, you only **need one piece** to make **SAS**, **ASA**, or **AAS**. The trick is knowing what you need. For example, if I were proving Similarity, I wouldn't use AAS or ASA, I'd *need to use SAS*. So, I'd *need* the other side.

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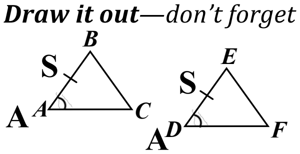
EXAMPLE
$\triangle ABC$ and $\triangle DEF$ are two triangles such that $\overline{AB} \cong \overline{DE}$ and $\angle A \cong \angle D$. What else would be needed to prove that $\triangle ABC \cong \triangle DEF$?
Draw it out*—don't forget to mark it!*


We have AS, which could make
ASA if we had $\boxed{\angle B \cong \angle E}$
or AAS if we had $\boxed{\angle C \cong \angle F}$
or SAS if we had $\boxed{\overline{AC} \cong \overline{DF}}$

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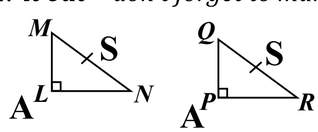
EXAMPLE
$\triangle LMN$ and $\triangle PQR$ are two triangles such that $\overline{MN} \cong \overline{QR}$ and $\angle L$ & $\angle P$ are right angles. What else would be needed to prove that $\triangle LMN \cong \triangle PQR$?
Draw it out*—don't forget to mark it!*


The A & S can't connect, so we need something between them, like:
AAS if we had $\boxed{\angle M \cong \angle Q}$
or $\boxed{\angle N \cong \angle R}$
or, since it's right and we can use HL,
SSA if we had $\boxed{\overline{LM} \cong \overline{PQ}}$
or $\boxed{\overline{LN} \cong \overline{PR}}$

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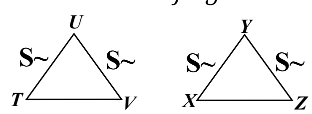
EXAMPLE
$\triangle TUV$ and $\triangle XYZ$ are two triangles such that
$$\frac{TU}{XY} = \frac{UV}{YZ}$$
What else would be needed to prove that $\triangle TUV \sim \triangle XYZ$?
Draw it out*—don't forget to mark it!*


For similar, I can use AA, SAS, or SSS. We have SS, so we could make either:
SAS if we had $\boxed{\angle U \cong \angle Y}$
or SSS if we had $\boxed{\frac{TV}{XZ} = \frac{TU}{XY}}$
or $\boxed{\frac{TV}{XZ} = \frac{UV}{YZ}}$

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1. $\triangle LMN$ and $\triangle PQR$ are two triangles such that $\overline{LM} \cong \overline{PQ}$ and $\overline{LN} \cong \overline{PR}$. What else would be needed to prove that $\triangle LMN \cong \triangle PQR$?

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2. $\triangle TUV$ and $\triangle XYZ$ are two triangles such that
$$\frac{TV}{XZ} = \frac{TU}{XY}$$
What else would be needed to prove that $\triangle TUV \sim \triangle XYZ$?

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3. $\triangle ABC$ and $\triangle DEF$ are two triangles such that $\angle B \cong \angle E$ and $\angle C \cong \angle F$. What else would be needed to prove that $\triangle ABC \cong \triangle DEF$?

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4. $\triangle LMN$ and $\triangle PQR$ are two triangles such that
$$\frac{LN}{PR} = \frac{MN}{QR}$$
What else would be needed to prove that $\triangle LMN \sim \triangle PQR$?

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5. $\triangle TUV$ and $\triangle XYZ$ are two triangles such that $\angle V \cong \angle Z$ and $\angle T \cong \angle X$. What else would be needed to prove that $\triangle TUV \cong \triangle XYZ$?

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6. $\triangle ABC$ and $\triangle DEF$ are two triangles such that $\angle C \cong \angle F$. What else would be needed to prove that $\triangle ABC \sim \triangle DEF$?

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