Are the two triangles congruent? Explain how you know.

1.

**HL**

2.

**SAS**

3.

$72°$
$38°$ $70°$
$Q$ ___ $R$
1 in.

$38°$ $67°$
$T$ ___ $U$
1 in.
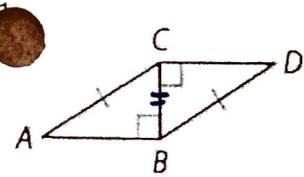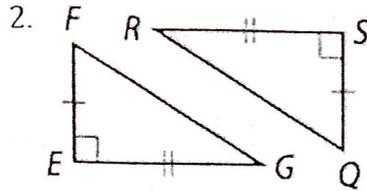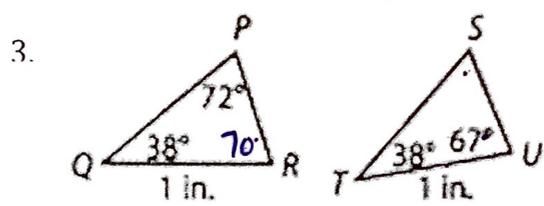
Not congruent
because ASA doesn't
work  $70° \neq 67°$

4.
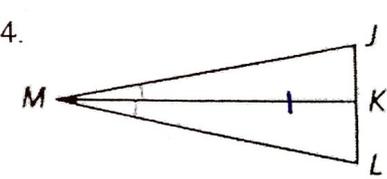
Not enough
information

5.

$G$ ___ $H$
$K$ ___ $J$

SSS

6.

$\triangle RST$ and $\triangle TUR$
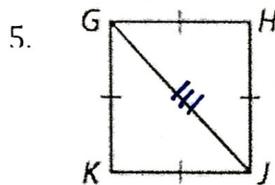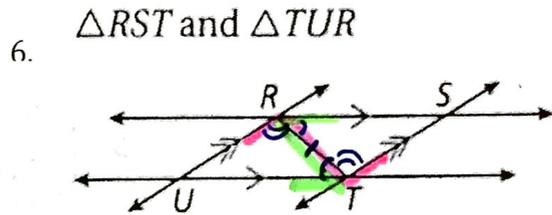
ASA

7.  Which of the following are reasons that justify why the
triangles are congruent? Select all that apply.

~~A.~~ SSA Triangle Congruence Theorem

(B.) SAS Triangle Congruence Theorem

(C.) ASA Triangle Congruence Theorem
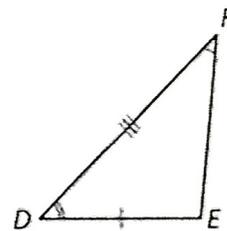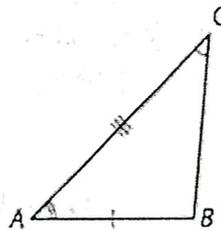
8.  What does CPCTC stand for? What do we use it for in proofs?

Corresponding Parts of $\cong$ Triangles are $\cong$
We use it to show additional parts are $\cong$ after
showing the triangles are $\cong$
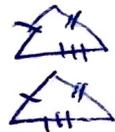
9.  Given: $\overline{DC}$ bisects $\angle ADB$
Prove: $\overline{AC} \cong \overline{BC}$

Write a paragraph proof.

AAS
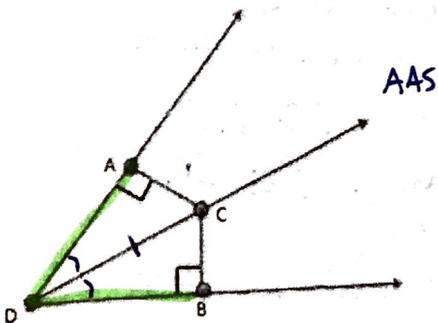
$\angle CAD \cong \angle CBD$  given
We also know that
$\overline{DC}$ bisects $\angle ADB$. Therefore,
$\angle ADC \cong \angle BDC$ by the definition of
angle bisector. Also, $\overline{DC} \cong \overline{DC}$
by the Reflexive Property. So,
$\triangle ADC \cong \triangle BDC$ by AAS and
$\overline{AC} \cong \overline{BC}$ by CPCTC

10. Given: ∠FGH and ∠JHK are right angles.
H is the midpoint of $\overline{GK}$. $\overline{FH} \cong \overline{JK}$
Prove: △FGH ≅ △JHK
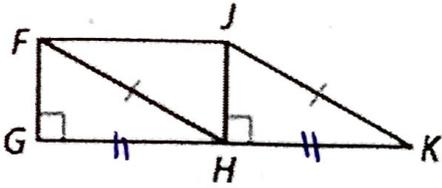
Write a two column proof.

| Statements | reasons |
|---|---|
| ∠FGH & ∠JHK are right angles | Given |
| $\overline{FH} \cong \overline{JK}$ | Given |
| H is the midpoint of GK | Given |
| $\overline{GH} \cong \overline{HK}$ | Def. of Midpoint |
| △FGH ≅ △JHK | HL |

11. Given: $\ell \parallel m$, $\overline{EG} \cong \overline{HF}$
Prove: △EGF ≅ △HFG

Write a flow chart proof.

$\overline{EG} \cong \overline{HF}$ Given (S)

∠EGF ≅ ∠EGFG $\ell \parallel m$ Given (A)

∠EGF ≅ ∠HFG Alt. Interior Angles

$\overline{GF} \cong \overline{GF}$ Reflexive Property (S)

△EGF ≅ △HFG SAS
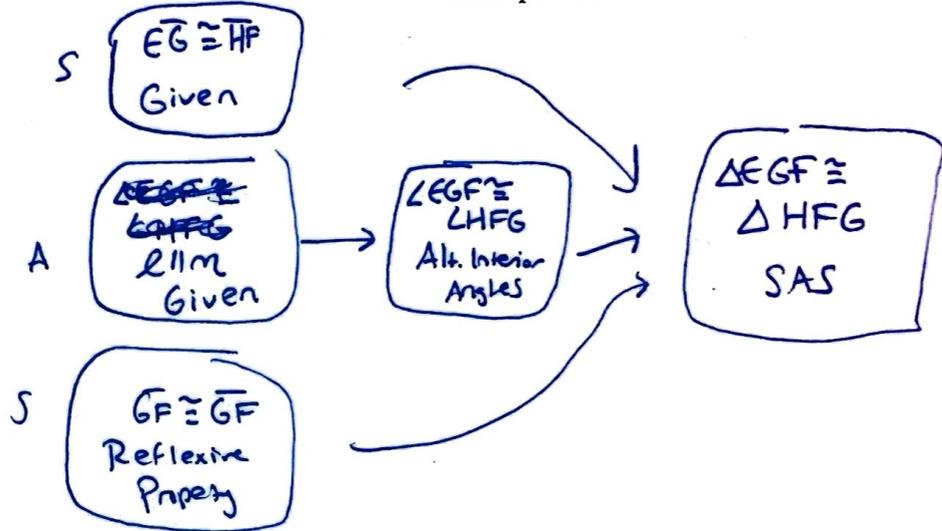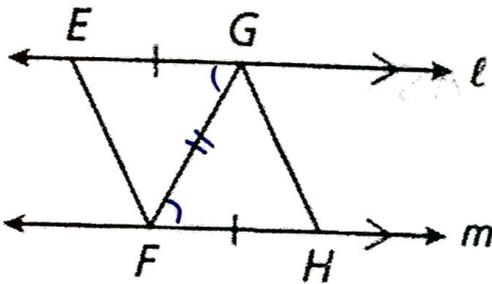
12. Given: $\overline{AB} \cong \overline{DC}$, ∠ABC ≅ ∠DCB
Prove: ∠A ≅ ∠D
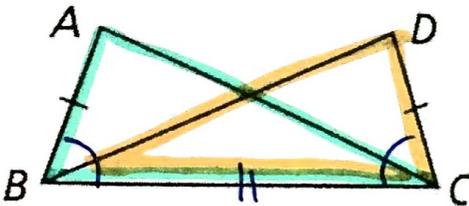
Write a two column proof.

| Statements | reasons |
|---|---|
| $\overline{AB} \cong \overline{DC}$ | Given |
| ∠ABC ≅ ∠DCB | Given |
| $\overline{BC} \cong \overline{BC}$ | Reflexive Property |
| △ABC ≅ △DCB | SAS |
| ∠A ≅ ∠D | CPCTC |

Challenge!
Given: $\overline{RU} \cong \overline{TV}$, $\overline{RS} \cong \overline{TS}$
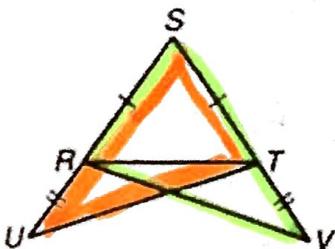
Prove: $\overline{RV} \cong \overline{TU}$

Write a paragraph proof.

We are given that $\overline{RU} \cong \overline{TV}$ and $\overline{RS} \cong \overline{TS}$ so by the segment addition postulate, $\overline{US} \cong \overline{VS}$. Also ∠S ≅ ∠S by the reflexive property. $\overline{ST} \cong \overline{SR}$ because it is given. Therefore, △SUT ≅ △SVR by SAS and $\overline{RV} \cong \overline{TU}$ by CPCTC.