(DN) Copy and complete the statement:

In lesson 4.1, SAS stood for _____________. In lesson 4.3, ASA stood for ______________ and SSS will stood for __________. In today's lesson, AAS will stand for ___ and HL will stand for ________. (take a guess on this one)

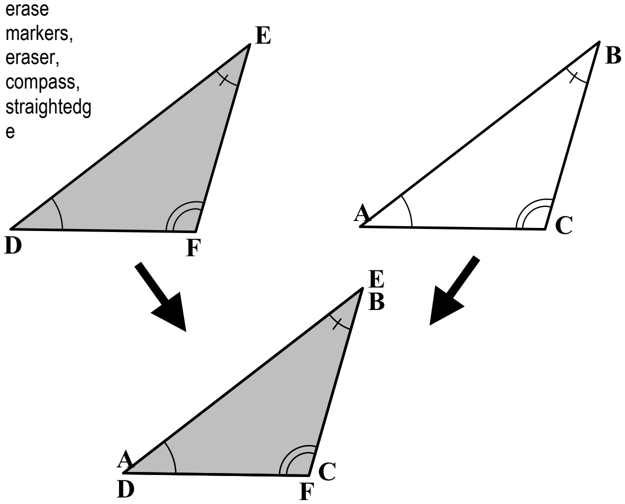
Name ________________________________**Per**______

LO: I can determine whether or not two triangles can be proven congruent by AAS≅ or HL≅ and use the shortcut to prove that triangles or their parts are congruent.

☐ (1) transparencies, dry erase markers, eraser, compass, straightedge

Congruence: Does AAA guarantee that triangles are congruent?

To answer this, complete the questions below.



☐ (a) List the pairs of congruent angles for the diagram at left:

_____ ≅ _____, _____ ≅ _____, _____ ≅ _____

Does △DEF map to △ABC by rigid transformation? __________

because ____

____

____

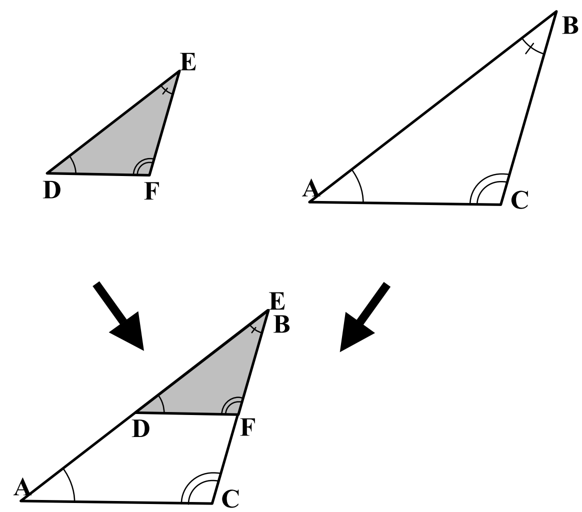
☐ (b) List the pairs of congruent angles for the diagram at right: _____ ≅ _____, _____ ≅ _____, _____ ≅ _____

Does △DEF map to △ABC by rigid transformation?

_________ because___________________________________

____

____



☐ (c) Based on your responses in parts (a) and (b), does AAA guarantee congruent triangles (that means **always**)?________ because ____

____

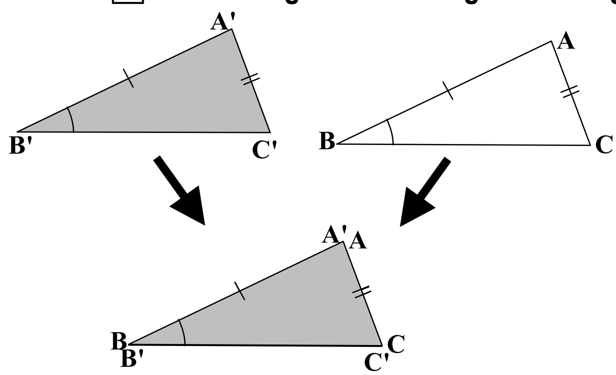
____

____

☐ (2) cont.

Congruence: Does SSA guarantee that triangles are congruent?

☐ **Does SSA guarantee congruent triangles? (trace to check)**



☐ (a) List the pairs of congruent parts for the diagram at left:

_____ ≅ _____, _____ ≅ _____, _____ ≅ _____

This is called SSA because the angles are/are not (circle one) between the sides. Does △A'B'C' map to △ABC by rigid transformation? _________ because _____________________

____

____So, the triangles are/are not (circle one) congruent.

☐ (b) List the pairs of congruent parts for the diagram at right:

_____ ≅ _____, _____ ≅ _____, _____ ≅ _____

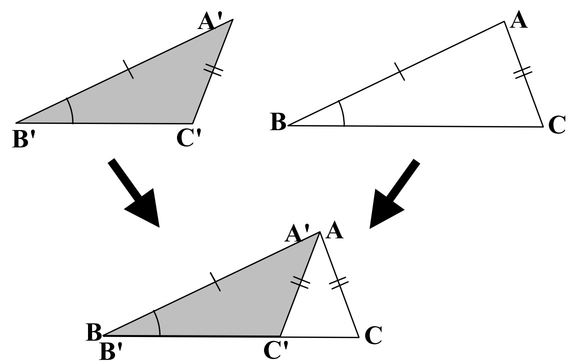
Are the pairs of ≅ sides and angles the same as the ones in part (a)? _______ Is this SSA? _______

Does △A'B'C' map to △ABC by rigid transformation?

___________ because ________________________________

____

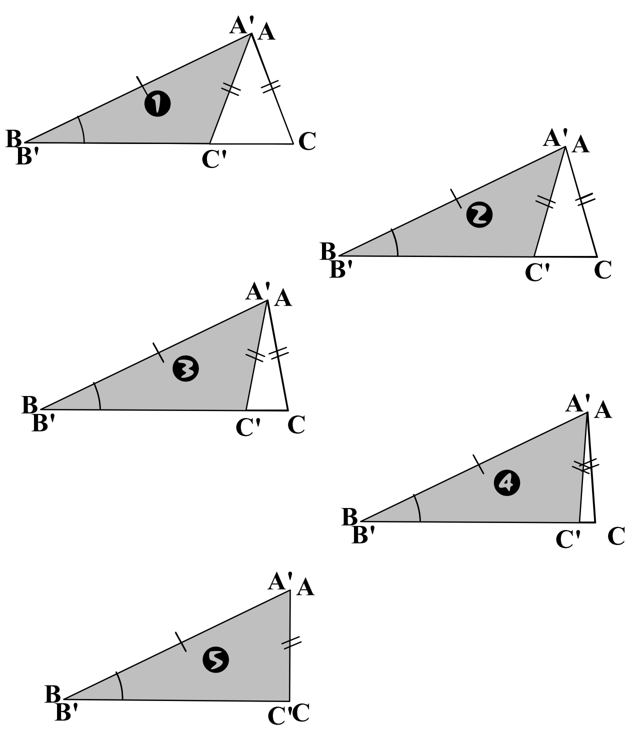
So, the triangles are/are not (circle one) congruent.



☐ (c) Based on your responses in parts (a) and (b), does SSA guarantee congruent triangles (that means **always**)?_______

because ____

____



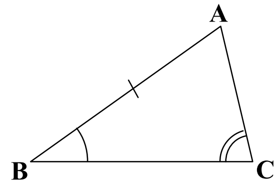
☐ (d) In diagrams 1 – 5 at right, SSA is still given. For each diagram, write ***"≅"*** if the pair of overlapping triangles are congruent or ***"not ≅,"*** if they are not.

1_____ 2_____ 3_____ 4_____ 5_____

In diagram 5, ∠____ finally coincides with ∠____ and the angle measures _______°. So, △ABC and △A'B'C' are ___________ triangles. So, SSA guarantees congruent triangles, but ONLY when the two triangles are ______________ triangles. Since it only happens with _______________ triangles, we don't call it SSA. Instead, we call it **Hypotenuse Leg Congruence (HL≅)**.

☐ (3) ☐ **Congruence: Does AAS guarantee that triangles are congruent?**

We have looked at SAS, ASA, SSS, AAA, SSA, and the special case of SSA which is HL. CIRCLE the shortcuts that guarantee congruent triangles. Are there any other shortcuts? What about AAS?

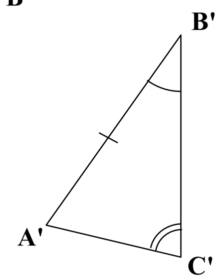


☐ (a) Use the diagram at right to describe the similarities between AAS and ASA.

____

☐ (b) Use the diagram at right to describe the differences between AAS and ASA.

____



☐ (c) Lets give angles B and C angle measures to see what we can say about the triangles. Let B = 30° and C = 70°. Based on this information, write the measure of each of the angles below:

A = ______ B' = ______ C' = ______ A' = ______

What do you notice about A and A'?___________________________________

☐ (d) Prove what you observed in part (c).

(1) An equation for △ABC is _________ + __________ +__________ = ________

(2) An equation for △A'B'C' is _________ + __________ +__________ = ________

(3) We know that _______ + ________ + _________ = ________ + ________ + _________ because we can substitute _____________ _______________.

(4) We also know that ________ + _________ = ________ + ________ because the angle pairs are congruent.

(5) We can write _______ + ________ + _________ = ________ + ________ + _________ by substituting equal values from step 4 into the equation from step 2.

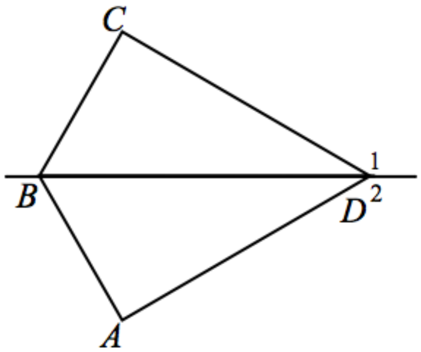
(6) Now we know that _______ = ________.

☐ (e) SO WHAT? Well, we can always force an AAS situation into an ASA situation like we did above, but that is a lot of extra work. Since we learned in (d) that we can **always** force AAS into ASA, we can just use _________ as a shortcut for proving triangles congruent and not bother with the extra work of forcing _________ into ASA.

(3) ☐ Complete the triangle congruence notes on the Unit 5 notes packet.

☐ (4) ☐ Given $\overline{BC} \perp \overline{CD}$, $\overline{AB} \perp \overline{AD}$, $\angle 1 \cong \angle 2$ (HINTS: 6 steps, you'll need linear pair OR exterior angle theorem)

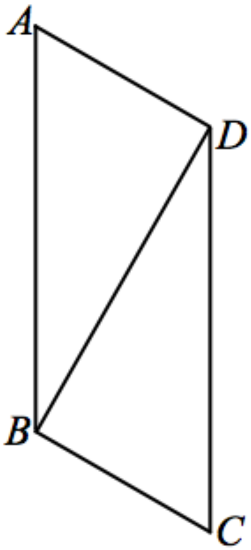
Prove: $\triangle BCD \cong \triangle BAD$



Choose which to use
SAS≅
ASA≅
SSS≅
AAS≅
HL≅

☐ (5) ☐ Given $\overline{AD} \perp \overline{BD}$, $\overline{BD} \perp \overline{BC}$, $\overline{AB} \cong \overline{CD}$ (HINTS: 4+ steps)

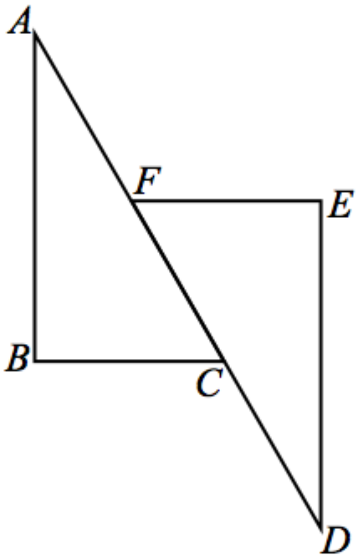
Prove: $\triangle ABD \cong \triangle CDB$



Choose which to use
SAS≅
ASA≅
SSS≅
AAS≅
HL≅

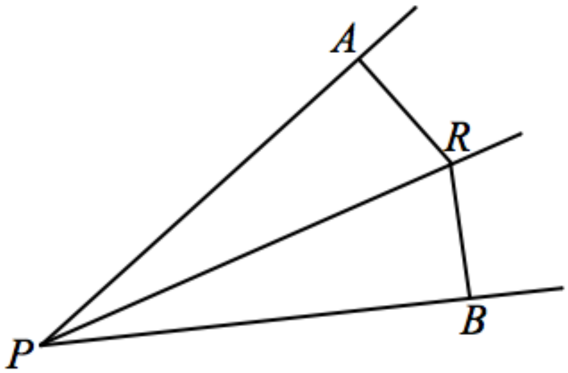
☐ (6) ☐ Given $\overline{AB} \perp \overline{BC}$, $\overline{DE} \perp \overline{EF}$, $\overline{BC} \parallel \overline{EF}$, $\overline{AF} \cong \overline{DC}$ (HINTS: ≅ segments + same segment are =)

Prove: $\triangle ABC \cong \triangle DEF$



☐ (7) ☐ Given $\overline{PR} \perp \overline{AR}$, $\overline{PB} \perp \overline{BR}$, R is equidistant from $\overline{PA}$ and $\overline{PB}$ (HINTS: 7+ steps, equidistant means . . .)

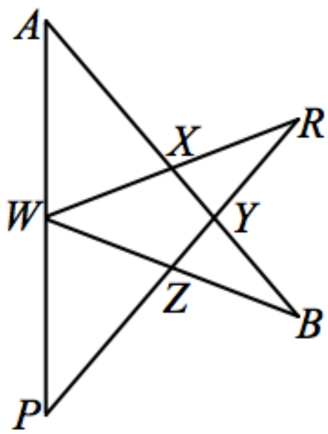
Prove: $\overline{PR}$ bisects ∠APB



☐ (8)

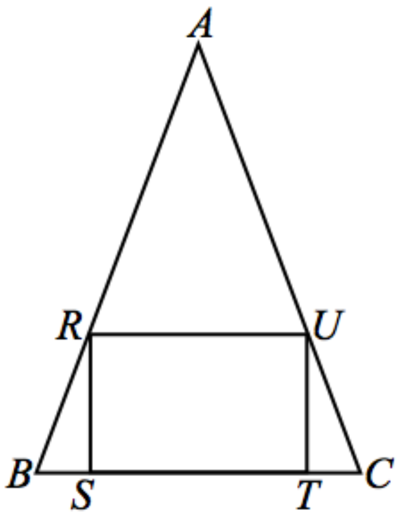
☐ Given $\angle A \cong \angle P$, $\angle B \cong \angle R$, W is the midpoint of $\overline{AP}$ (HINTS: 4+ steps, what does midpoint give us, use highlighters or redraw)

Prove: $\overline{RW} \cong \overline{BW}$



☐ (9) ☐ Given $\overline{BR} \cong \overline{CU}$, rectangle RSTU (HINTS: 6+ steps, prove △RBS≅△UCT, what do we know about rectangle sides and angles, can we get ≅ base angles to prove ≅ sides)

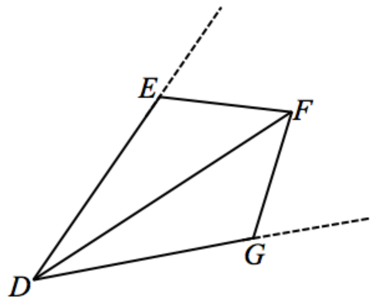
Prove: △ARU is isosceles



☐ (10) **Exit Ticket**

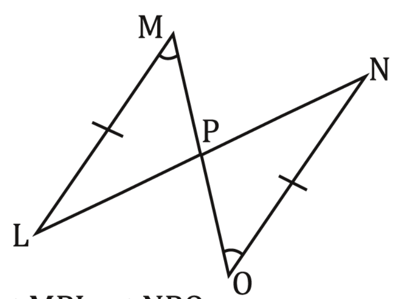
☐ Given: $\overline{DE} \cong \overline{DG}$, $\overline{EF} \cong \overline{GF}$

Prove: $\overline{DF}$ bisects ∠EDG



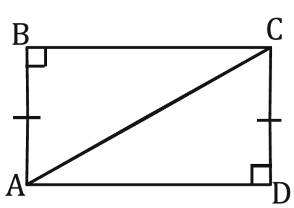
☐ (11) **Homework: Do 7 of the 28 problems.**

☐ **(1)** Given: $\overline{LM} \cong \overline{NO}$, and ∠M≅∠O



Prove: △MPL≅△NPO

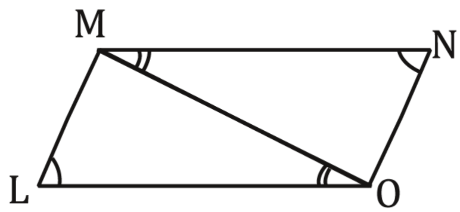
☐ **(2)** Given: $\overline{AB} \cong \overline{DC}$ and B and D are right angles



Prove: △ABC≅△CDA

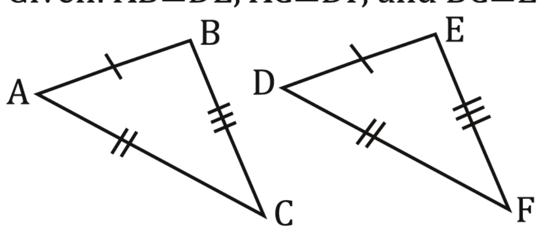
☐ (11) **Homework**

☐ **(3)** Given: $\angle L \cong \angle N$, $\angle LOM \cong \angle NMO$



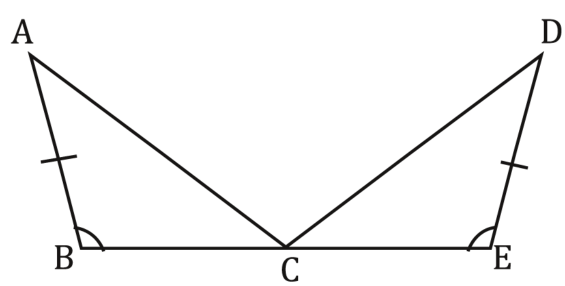
Prove: $\triangle LMO \cong \triangle NOM$

☐ **(4)** Given: $\overline{AB} \cong \overline{DE}$, $\overline{AC} \cong \overline{DF}$, and $\overline{BC} \cong \overline{EF}$



Prove: $\triangle ABD \cong \triangle DEF$

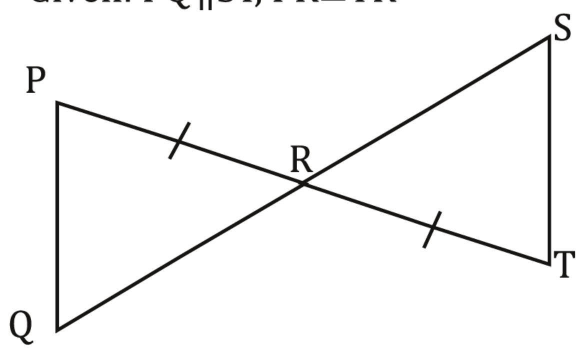
☐ **(5)** Given: C is the midpoint of $\overline{BE}$, $\angle B \cong \angle E$, and $\overline{AB} \cong \overline{DE}$



Prove: $\triangle ABC \cong \triangle DEC$

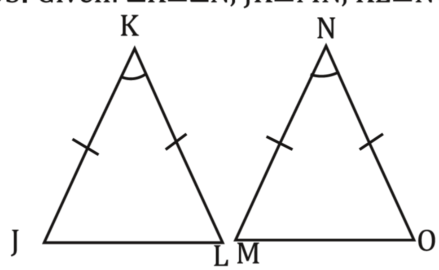
☐ (11) **Homework**

☐ **(6)** Given: $\overline{PQ} \parallel \overline{ST}$, $\overline{PR} \cong \overline{TR}$



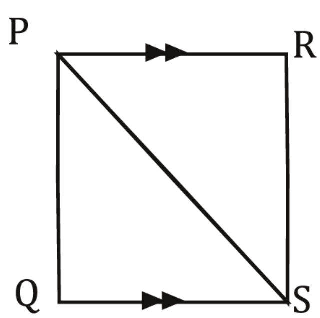
Prove: $\triangle PQR \cong \triangle TSR$

☐ **(7)** 33. Given: $\angle K \cong \angle N$, $\overline{JK} \cong \overline{MN}$, $\overline{KL} \cong \overline{NO}$



Prove: $\triangle JKL \cong \triangle MNO$

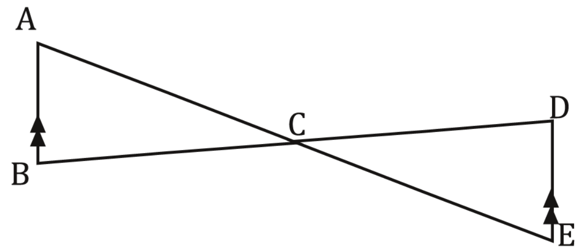
☐ **(8)** Given: $\overline{PR} \parallel \overline{QS}$, $\angle QPS \cong \angle RSP$



Prove: $\triangle PQS \cong \triangle SRP$

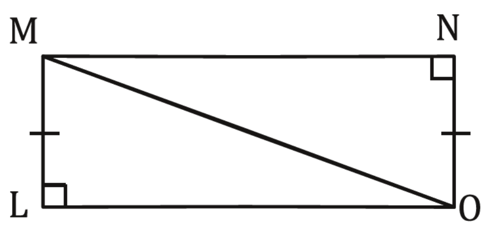
☐ (11) **Homework**

☐ **(9)** Given: $\overline{AE}$ bisects $\overline{BD}$, $\overline{AB} \parallel \overline{DE}$



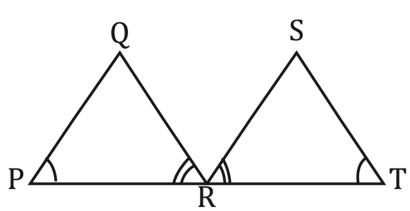
Prove: $\triangle ABC \cong \triangle DCE$

☐ **(10)** Given: $\overline{LM} \cong \overline{NO}$



Prove: $\triangle LMO \cong \triangle NOM$

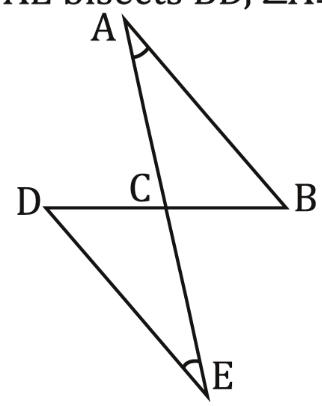
☐ **(11)** Given: R is the midpoint of $\overline{PT}$, $\angle P \cong \angle T$, and $\angle PRQ \cong \angle TRS$



Prove: $\triangle PQR \cong \triangle TSR$

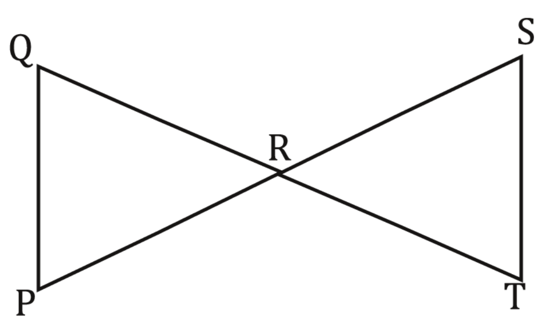
☐ (11) **Homework**

☐ **(12)** Given: $\overline{AE}$ bisects $\overline{BD}$, $\angle A \cong \angle E$



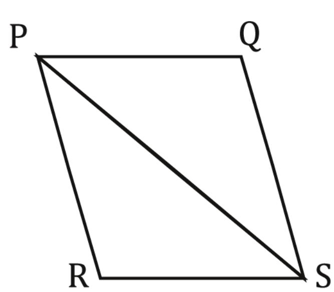
Prove: $\triangle ABC \cong \triangle EDC$

☐ **(13)** Given: $\overline{QT}$ bisects $\overline{SP}$, $\overline{SP}$ bisects $\overline{QT}$



Prove: $\triangle QRP \cong \triangle SRT$

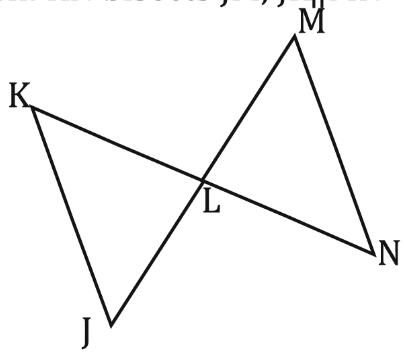
☐ **(14)** Given: PQRS is a parallelogram



Prove: $\triangle RPS \cong \triangle QSP$

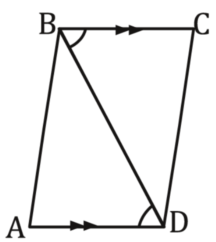
☐ (11) **Homework**

☐ **(15)** Given: $\overline{KN}$ bisects $\overline{JM}$, $\overline{JK} \| \overline{MN}$



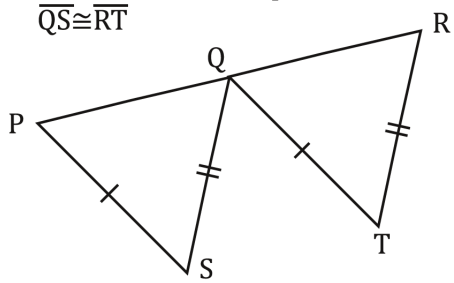
Prove: $\triangle JKL \cong \triangle MNL$

☐ **(16)** Given: $\overline{BA} \| \overline{CD}$ $\angle ADB \cong \angle CBD$



Prove: $\triangle ABD \cong \triangle CDB$

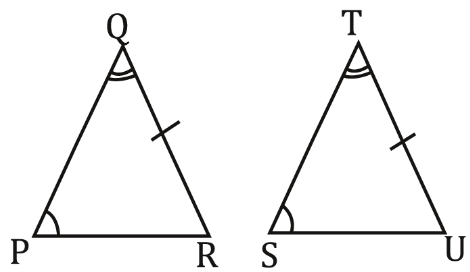
☐ **(17)** 18. Given: Q is the midpoint of $\overline{PR}$. $\overline{PS} \cong \overline{QT}$ and $\overline{QS} \cong \overline{RT}$



Prove: $\triangle PQS \cong \triangle RQT$

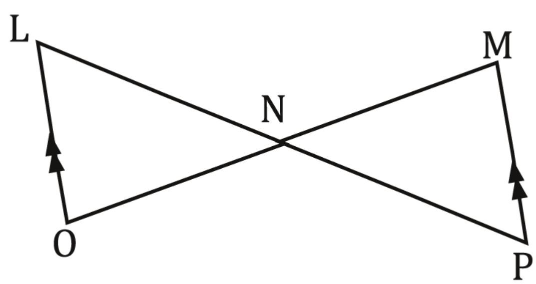
☐ (11) **Homework**

☐ **(18)** Given: $\angle P \cong \angle S$, $\angle Q \cong \angle T$, and $\overline{QR} \cong \overline{TU}$



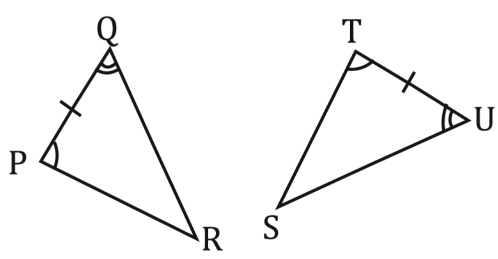
Prove: $\triangle PQR \cong \triangle STU$

☐ **(19)** Given: $\overline{LP}$ bisects $\overline{MO}$, $\overline{LO} \parallel \overline{MP}$



Prove: $\triangle LNO \cong \triangle MNP$

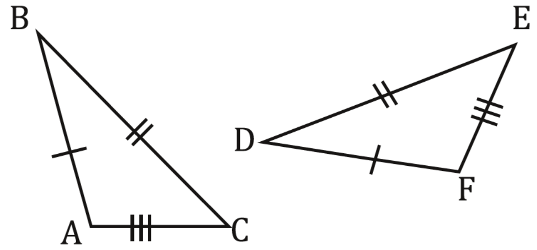
☐ **(20)** Given: $\overline{PQ} \cong \overline{TU}$, $\angle P \cong \angle T$, and $\angle Q \cong \angle U$



Prove: $\triangle PQR \cong \triangle TUS$

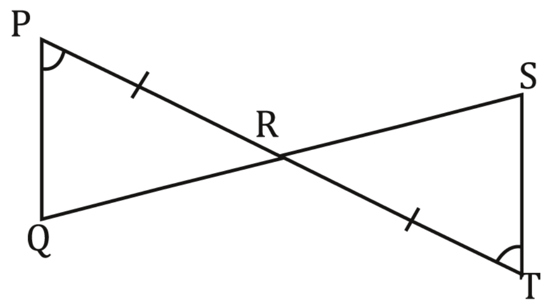
☐ (11) **Homework**

☐ **(21)** Given: $\overline{AB} \cong \overline{DF}$, $\overline{BC} \cong \overline{DE}$, and $\overline{AC} \cong \overline{EF}$



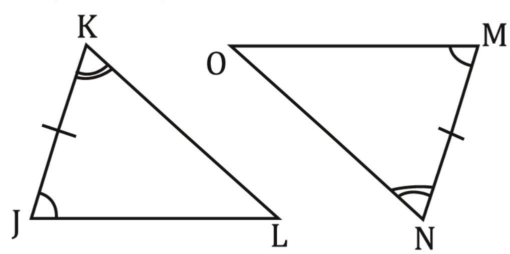
Prove: $\triangle ABD \cong \triangle FDE$

☐ **(22)** Given: $\overline{PR} \cong \overline{TR}$, $\angle P \cong \angle T$



Prove: $\triangle ABC \cong \triangle DBC$

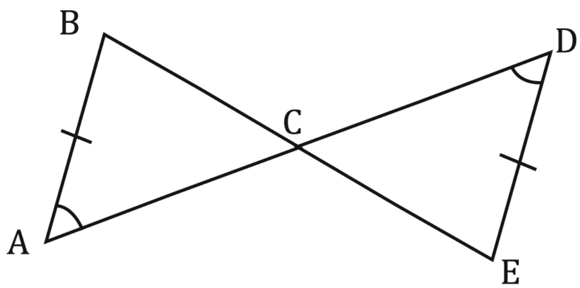
☐ **(23)** Given: $\angle J \cong \angle M$, $\overline{JK} \cong \overline{MN}$ and $\angle K \cong \angle N$



Prove: $\triangle JKL \cong \triangle MNO$

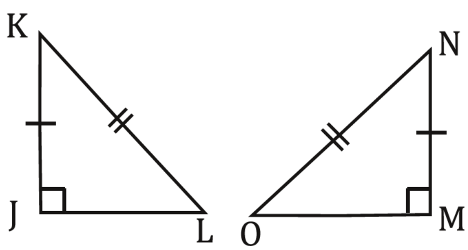
☐ (11) **Homework**

☐ **(24)**. Given: $\overline{AB} \cong \overline{ED}$, $\angle A \cong \angle D$



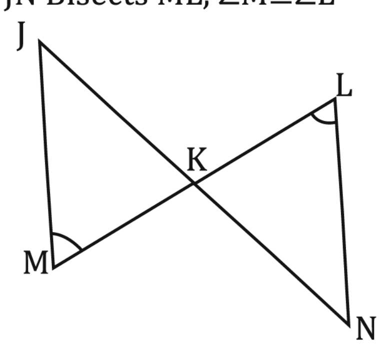
Prove: $\triangle ABC \cong \triangle DCE$

☐ **(25)** Given: $JK \cong MN$, $KL \cong NO$



Prove: $\triangle JKL \cong \triangle MNO$

☐ **(26)** Given: $\overline{JN}$ Bisects $\overline{ML}$, $\angle M \cong \angle L$

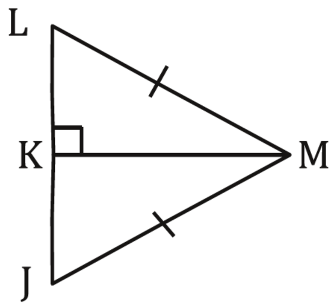


Prove: $\triangle MJK \cong \triangle LNK$

☐ (11) **Homework**

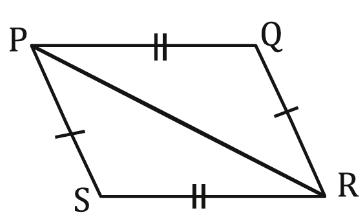
☐ **(27)**

☐ **(28)** Given: $\overline{LM} \cong \overline{JM}$



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

☐ **(29)** Given: $\overline{PS} \cong \overline{QR}$, $\overline{PQ} \cong \overline{SR}$



Prove: $\triangle PRS \cong \triangle RPQ$