

Triangle Congruence by SSS & SAS (Section 7-2)

* Side-Side-Side Postulate: If three sides of a triangle are congruent to the three sides of another triangle, then the two triangles are congruent.

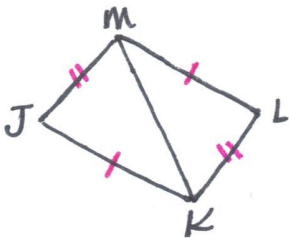
(SSS)

ex: If $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, & $\overline{AC} \cong \overline{DF}$ then $\triangle ABC \cong \triangle DEF$

#1

ex: Given: $\overline{JK} \cong \overline{LM}$, $\overline{JM} \cong \overline{LK}$

Prove: $\triangle JKM \cong \triangle LMK$



Statements	Reason
$\overline{JK} \cong \overline{LM}$	Given
$\overline{JM} \cong \overline{LK}$	Given
$\overline{KM} \cong \overline{KM}$	Reflexive
$\triangle JKM \cong \triangle LMK$	SSS

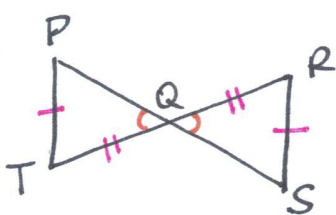
* Side-Angle-Side Postulate: If two sides & the included angle are congruent to two sides & the included angle of another triangle, then the two triangles are congruent.

(SAS)

ex: If $\overline{AB} \cong \overline{DE}$, $\overline{AC} \cong \overline{DF}$, & $\angle A \cong \angle D$, then $\triangle ABC \cong \triangle DEF$.

#5

ex:

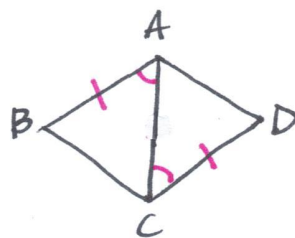


Are the triangles \cong ?

$\angle PQT \cong \angle SQR$, but that is not SAS \therefore Not enough info!

#6

ex:



Are the triangles \cong ?

$\overline{AC} \cong \overline{AC}$ by reflexive \therefore
 $\triangle BAC \cong \triangle DCA$ by SAS.

Triangle Congruence by ASA & AAS (Section 7-3)

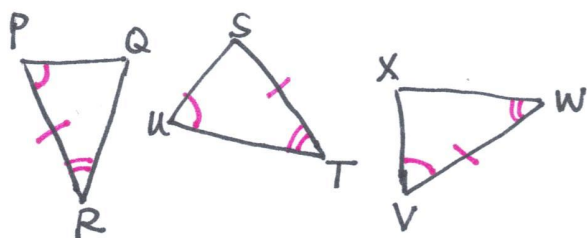
* Angle-Side-Angle Postulate: If two angles & an included side of a triangle is congruent to two angles & an included side of another triangle, then the two triangles are congruent.

(ASA)

ex: If $\angle A \cong \angle D$, $\angle C \cong \angle F$, and $\overline{AC} \cong \overline{DF}$, then

$$\triangle ABC \cong \triangle DEF$$

#1
ex:



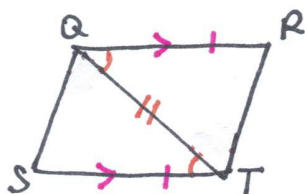
Name two congruent triangles.

$$\triangle PRQ \cong \triangle VWX \text{ by ASA}$$

#4

ex: Given: $\overline{QR} \cong \overline{TS}$, $\overline{QR} \parallel \overline{TS}$

Prove: $\triangle QRT \cong \triangle TSQ$



Statement	Reasons
$\overline{QR} \cong \overline{TS}$	Given
$\overline{QR} \parallel \overline{TS}$	Given
$\angle QTS \cong \angle TQR$	Alt. Int. Angles
$\overline{QT} \cong \overline{QT}$	Reflexive
$\triangle QRT \cong \triangle TSQ$	SAS

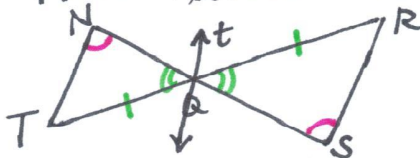
* Angle-Angle-Side Postulate: If two angles & a non-included side is congruent to two angles & a non-included side of another triangle, then the two triangles are congruent.

(AAS)

#5

ex: Given: $\angle N \cong \angle S$, line t bisects \overline{TR} @ Q

Prove: $\triangle NQT \cong \triangle SQR$

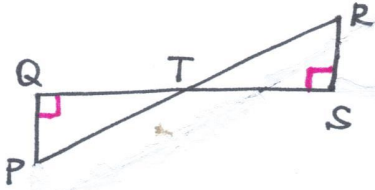


Statement	Reason
$\angle N \cong \angle S$, t bisects \overline{TR} @ Q	Given
$\overline{TQ} \cong \overline{SQ}$	Def. of bisector
$\angle TQN \cong \angle RQS$	Vert. Angles
$\triangle NQT \cong \triangle SQR$	AAS

#6

ex: Given: $\overline{PQ} \perp \overline{QS}$, $\overline{RS} \perp \overline{SQ}$
T is mid-pt of \overline{PR}

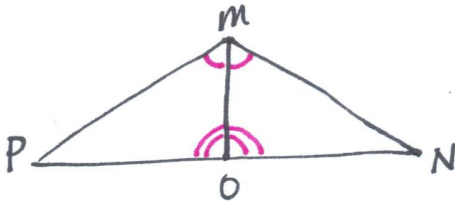
Prove: $\triangle PQT \cong \triangle RST$



Statement	Reason
$\overline{PQ} \perp \overline{QS}$, $\overline{RS} \perp \overline{SQ}$	Given
T is mid-pt of \overline{PR}	Given
$\overline{PT} \cong \overline{TR}$	def of mid-pt.
$\angle PQT$ & $\angle RST$ are rt. angles	def of right angle
$\angle PQT \cong \angle RST$	all rt. angles are \cong
$\angle PTQ \cong \angle RTS$	vert angles
$\triangle PQT \cong \triangle RST$	AAS

#7

ex:

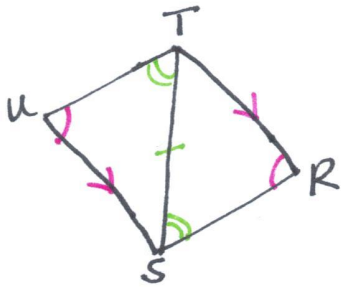


Are the triangles congruent?

Yes, $\overline{MO} \cong \overline{MO}$ by reflexive so
 $\triangle PMO \cong \triangle NMO$ by ASA

#8

ex:



Are the triangles congruent?

Yes, $\overline{TS} \cong \overline{TS}$ by reflexive & $\angle UTS \cong \angle RST$
by Alt. Int. Angles so $\triangle UTS \cong \triangle RST$
by AAS.