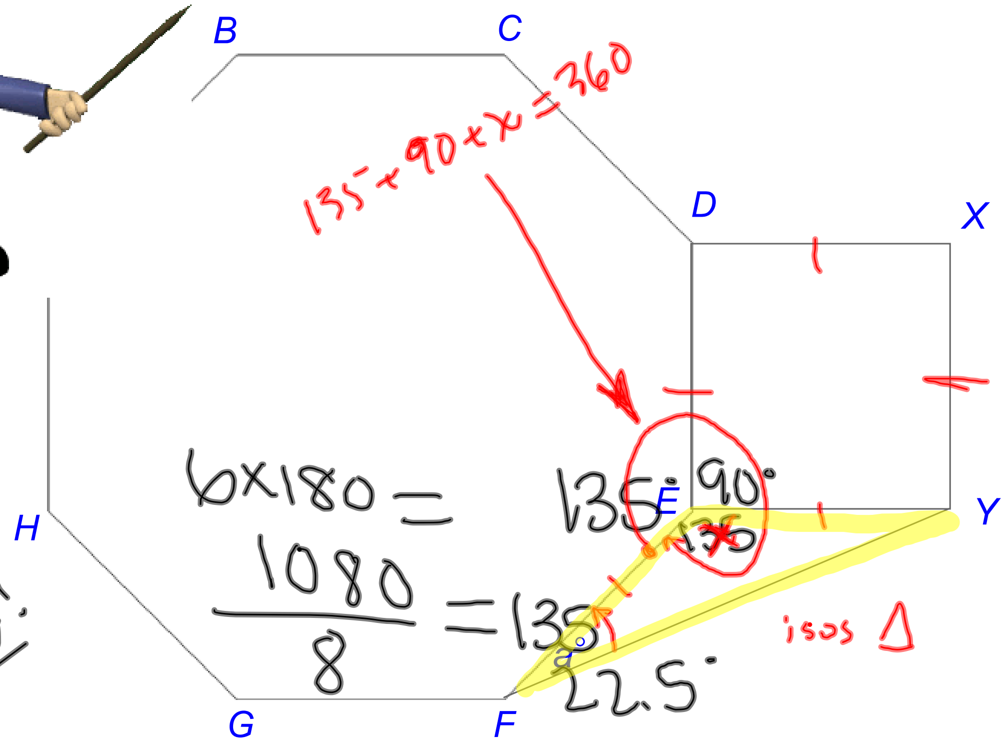
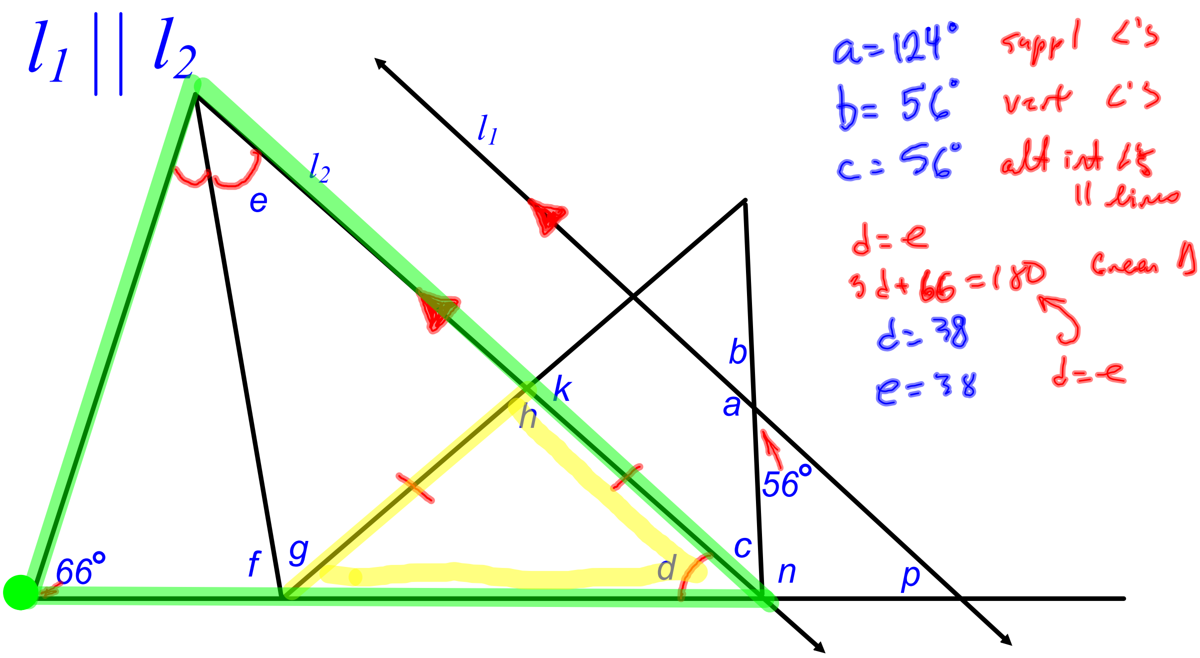
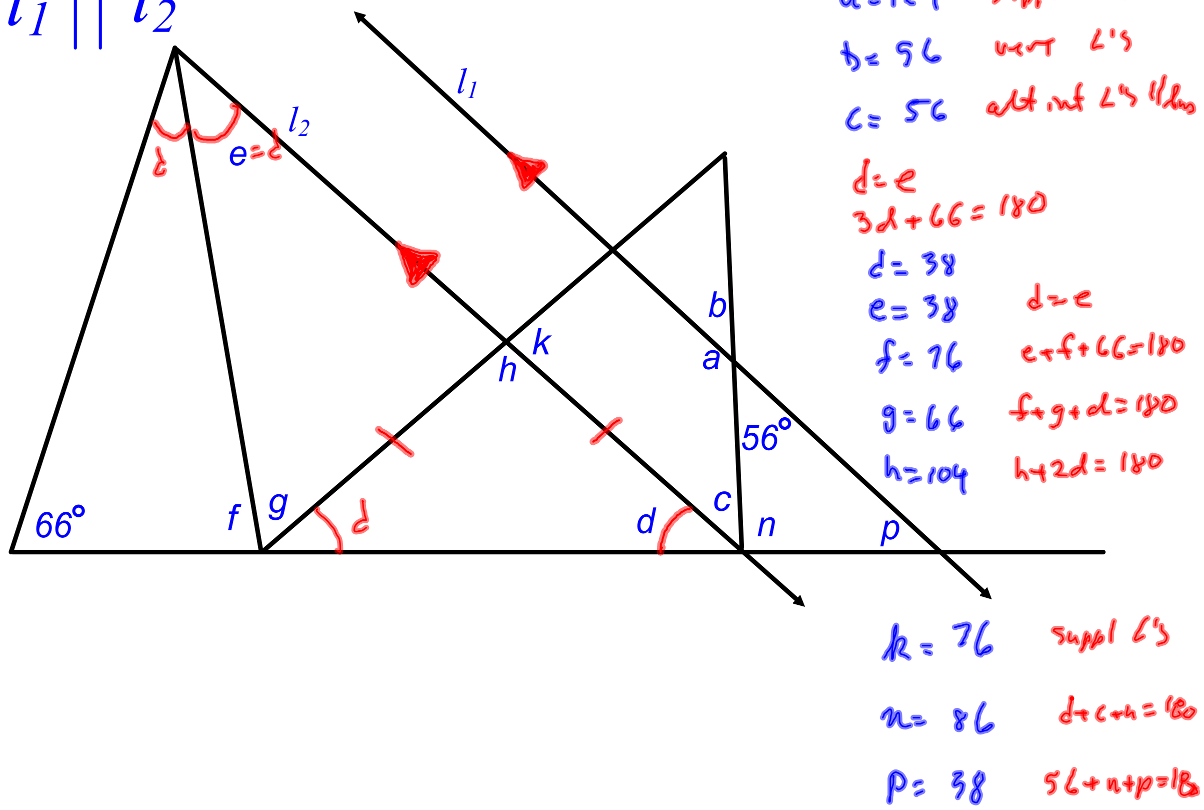
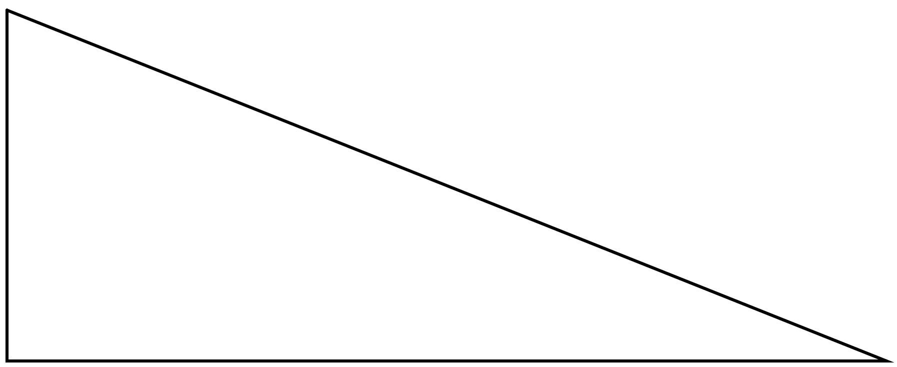
BCDEFGH & *DEYX* are regular polygons.
e value of *a* and justify your answer.

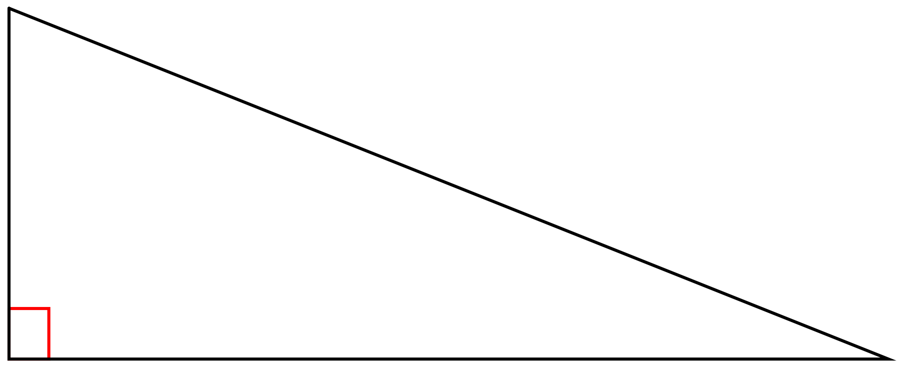


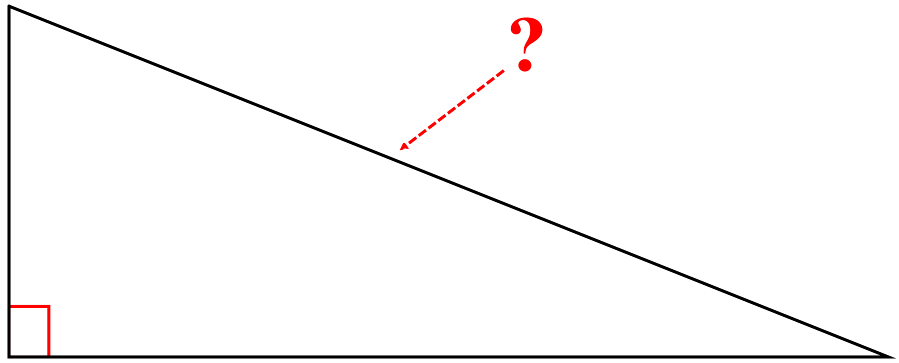


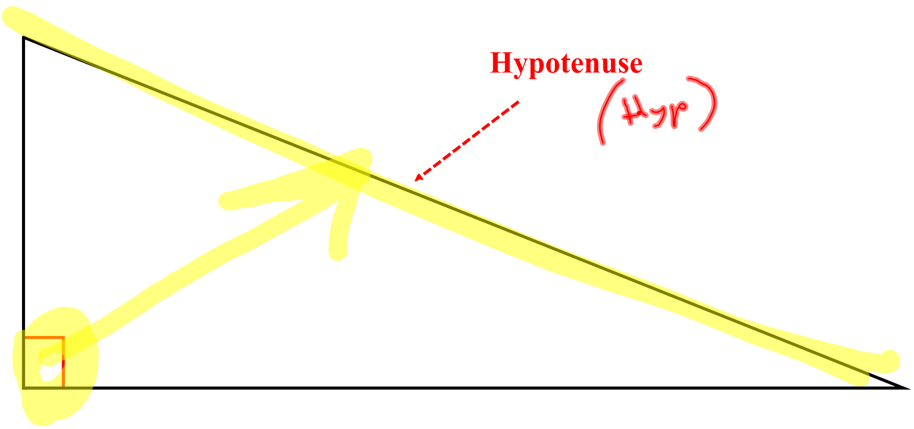
$l_1 \parallel l_2$

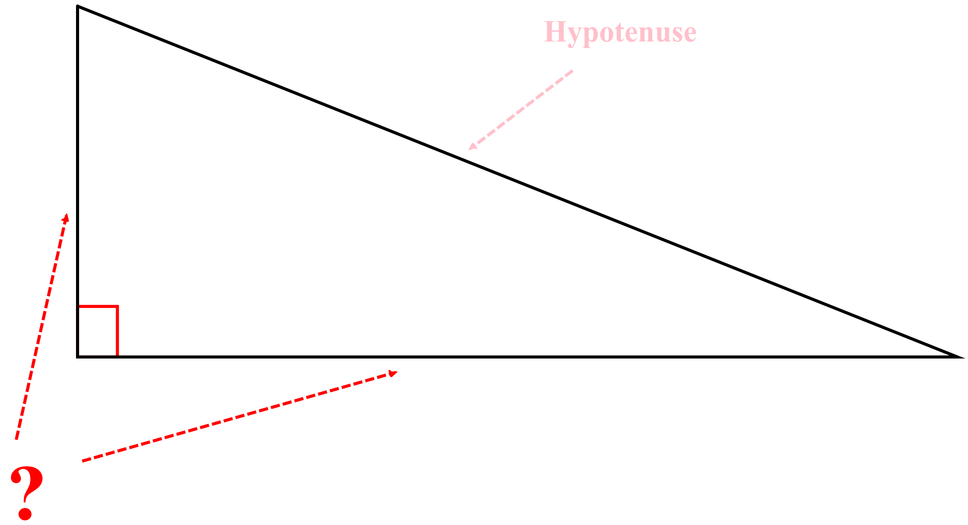


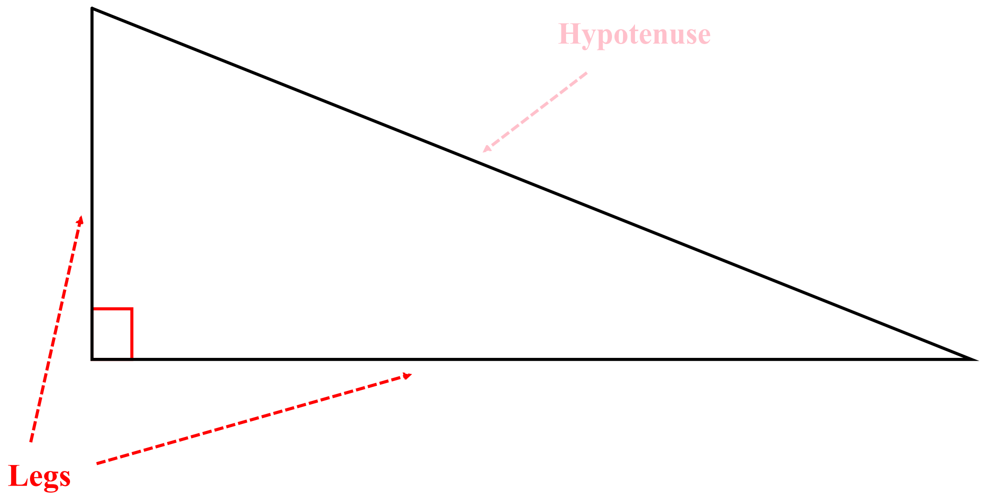


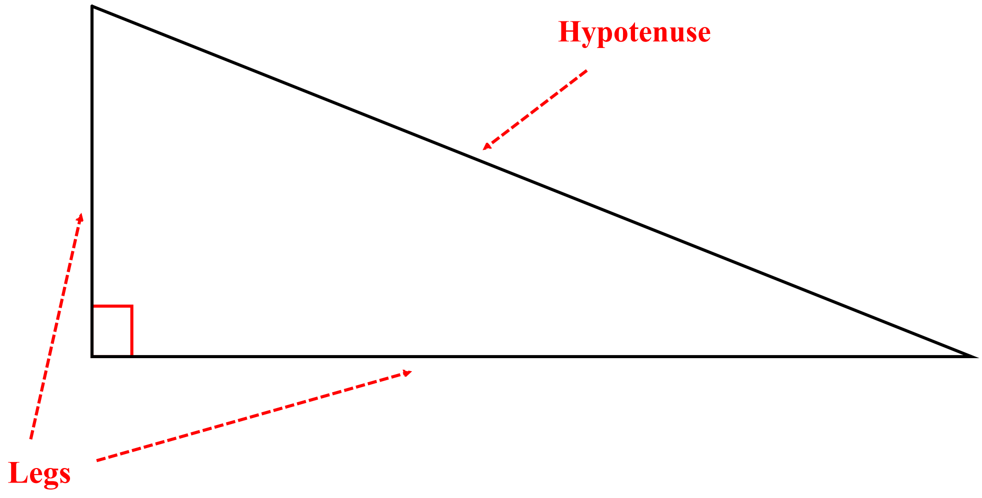





Hypotenuse
(Hyp)


Hypotenuse
?


Hypotenuse
Legs


Hypotenuse
Legs

Is *SSA* a valid method for proving $\Delta \cong$?

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Nope

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Nope ... except ...

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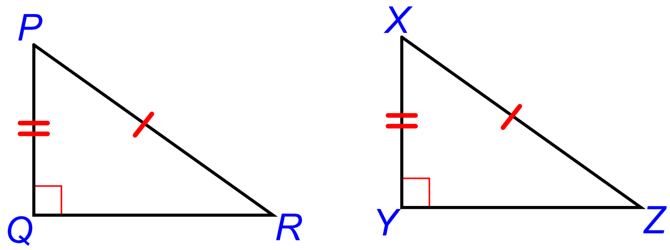
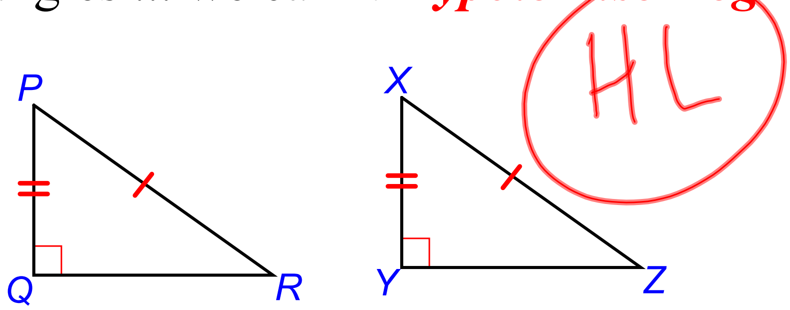
Right triangles ...



Is *SSA* a valid method for proving $\Delta \cong$?

Nope ... except ... for one special case ...

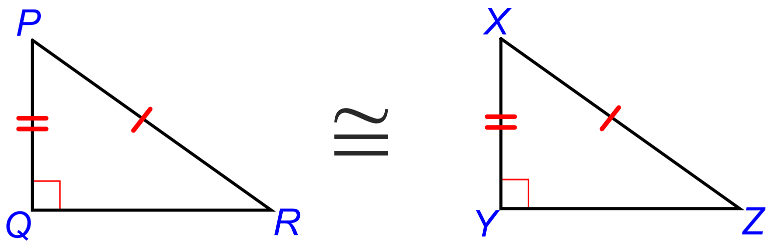
Right triangles ... we call it ***Hypotenuse-Leg***



Theorem 4-6: Hypotenuse Leg (HL) Thm

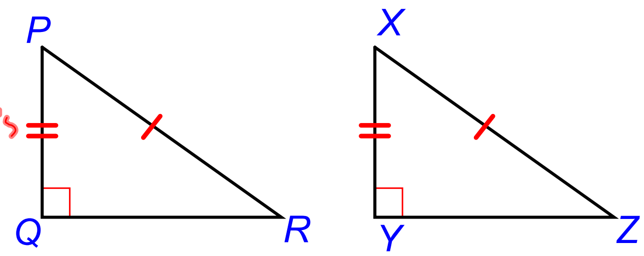
If the hypotenuse & a leg or 1 right Δ are
≅ to the hyp. & leg of a 2nd rt Δ

Then the Δ's are ≅

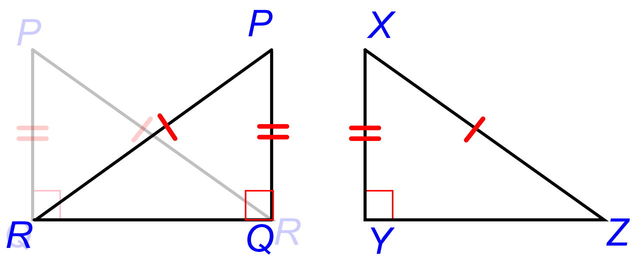


Given $\overline{PR} \cong \overline{XZ}$ Hyp ≅
$\overline{PQ} \cong \overline{XY}$ 1 pair legs ≅
$\angle Q$ & $\angle Y$ are rt ∠'s Rt Δ's

Prove $\Delta PRQ \cong \Delta XZY$



Given	$\overline{PR} \cong \overline{XZ}$
	$\overline{PQ} \cong \overline{XY}$
	$\angle Q$ & $\angle Y$ are rt $\angle$'s
Prove	$\Delta PRQ \cong \Delta XZY$



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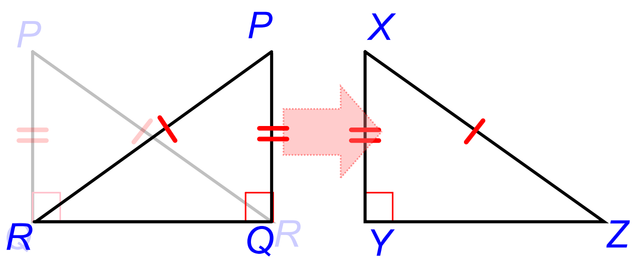

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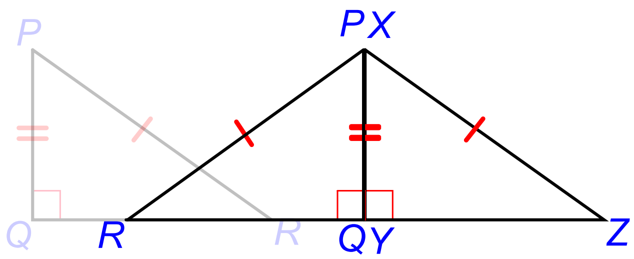

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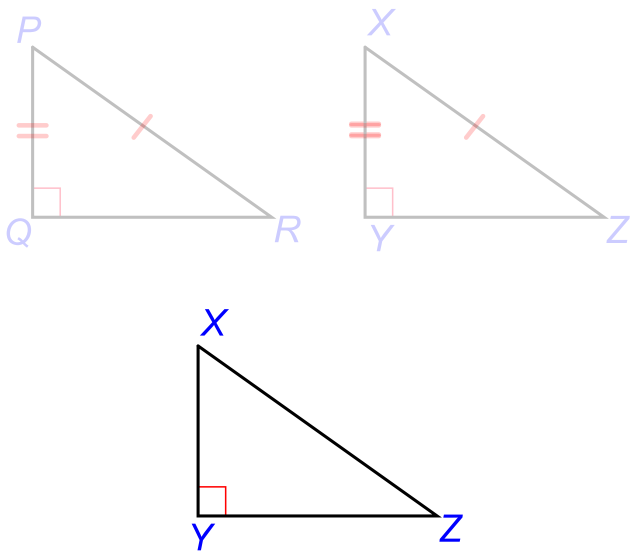

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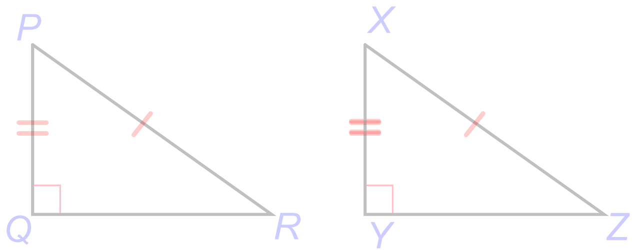
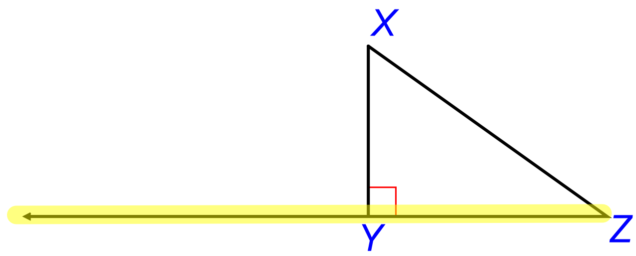
$\angle Q$ & $\angle Y$ are rt $\angle$'s

Prove $\Delta PRQ \cong \Delta XZY$

Construct $\overrightarrow{ZY}$





Given $\overline{PR} \cong \overline{XZ}$

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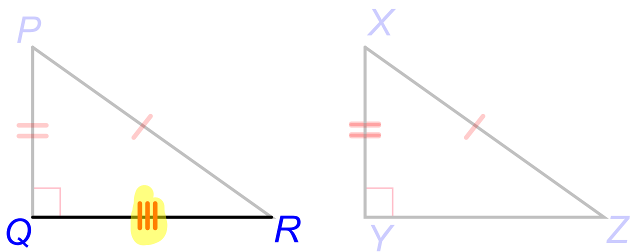
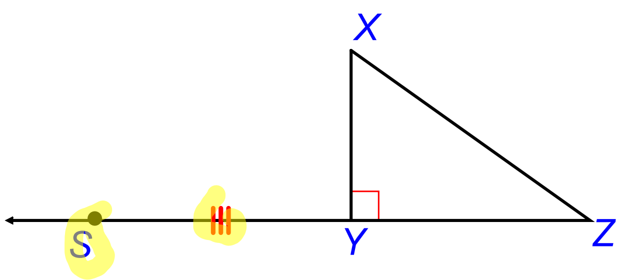
$\angle Q$ & $\angle Y$ are rt $\angle$'s

Prove $\Delta PRQ \cong \Delta XZY$

Construct $\overrightarrow{ZY}$

Mark S on $\overrightarrow{ZY}$ so $\overline{YS} \simeq \overline{QR}$





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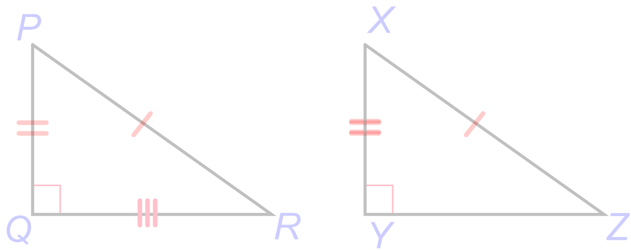

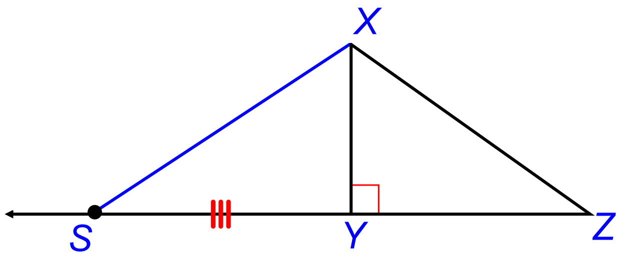

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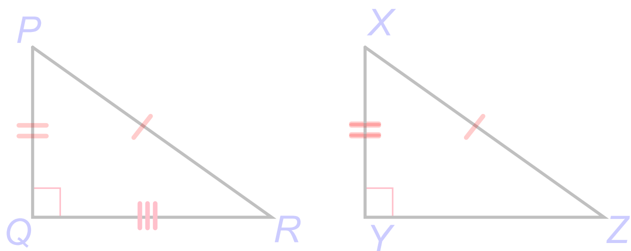

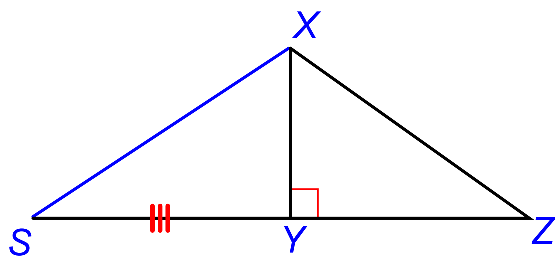

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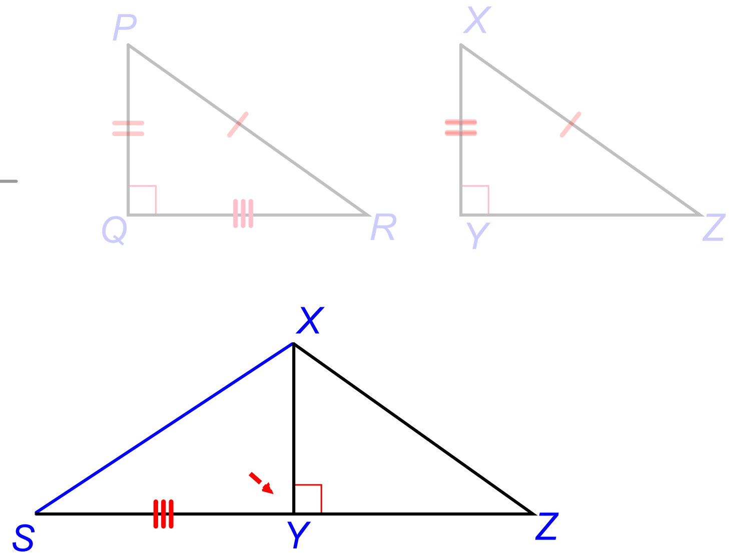

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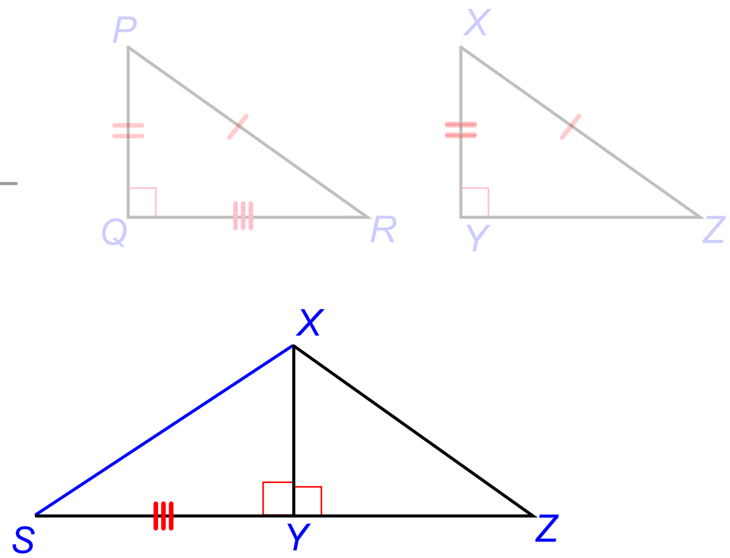

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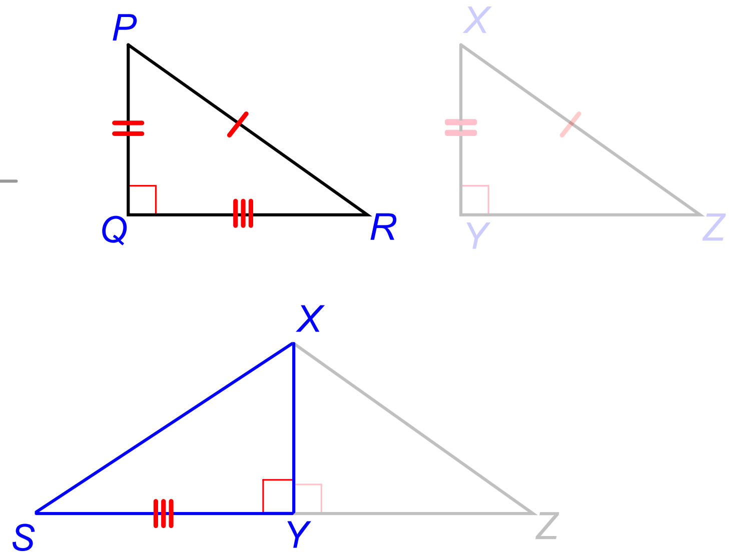

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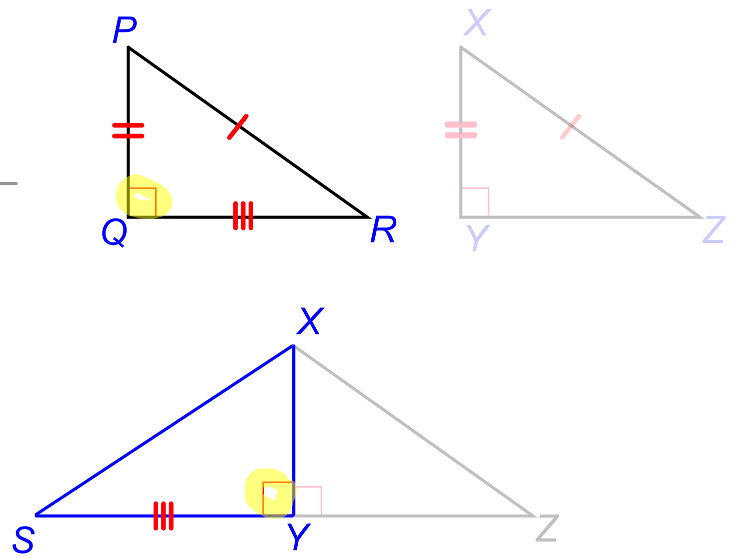
Prove $\Delta PRQ \cong \Delta XZY$

Construct $\overrightarrow{ZY}$

Mark S on $\overrightarrow{ZY}$ so $\overline{YS} \cong \overline{QR}$

$\angle PQR \cong \angle XYS$ all rt$\angle$'s $\cong$



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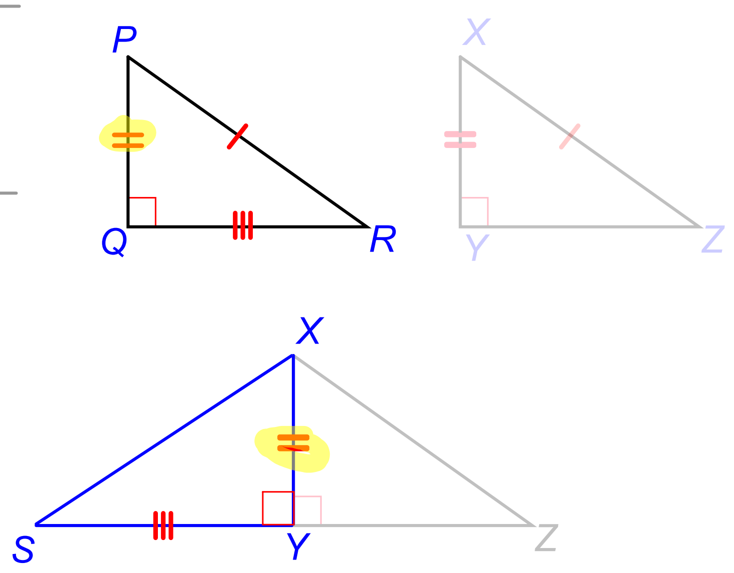
Prove $\Delta PRQ \cong \Delta XZY$

Construct $\overrightarrow{ZY}$
Mark S on $\overrightarrow{ZY}$ so $\overline{YS} \cong \overline{QR}$

$\angle PQR \cong \angle XYS$	all rt $\angle$'s $\cong$
$\overline{PQ} \cong \overline{XY}$	given



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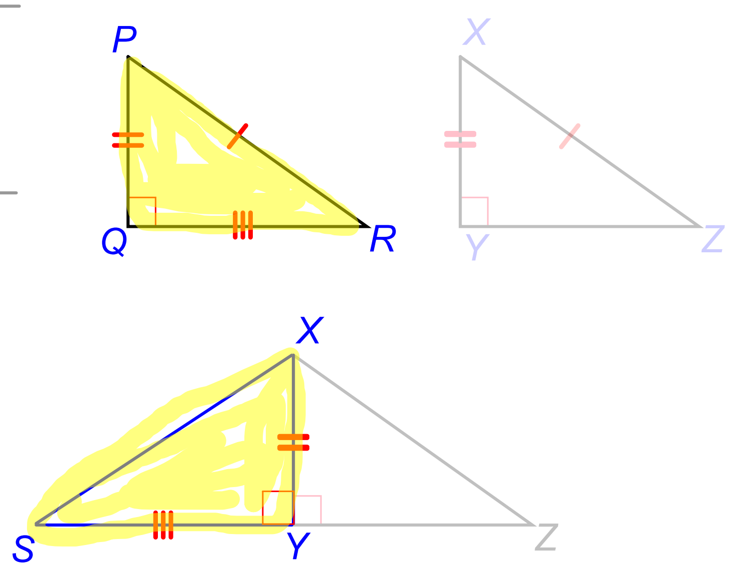
$\angle PQR \cong \angle XYS$	all rt $\angle$'s $\cong$
$\overline{PQ} \cong \overline{XY}$	given
$\Delta PQR \cong \Delta XYS$	SAS



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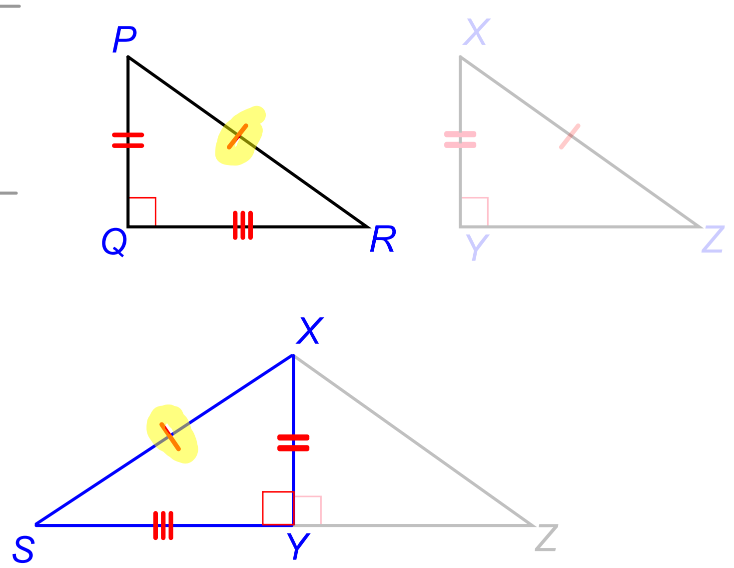

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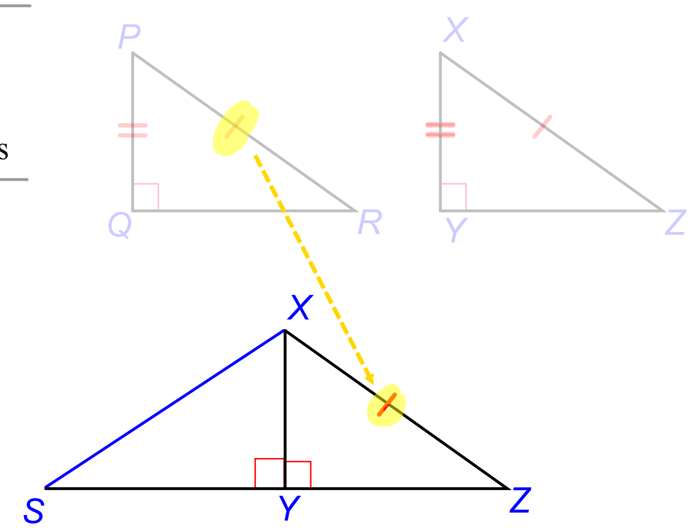

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$\angle PQR \cong \angle XYS$	all rt $\angle$'s $\cong$
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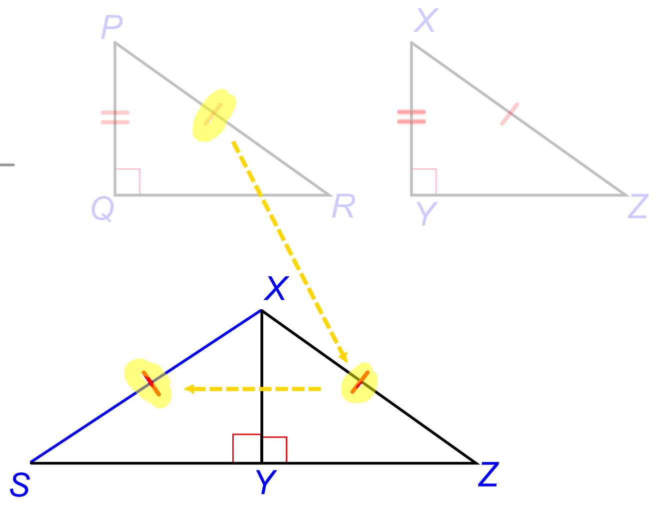
$\Delta PQR \cong \Delta XYS$	SAS
$\overline{PR} \cong \overline{XS}$	CPCTC
$\overline{XS} \cong \overline{XZ}$	trans POC



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$\angle PQR \cong \angle XYS$	all rt $\angle$'s $\cong$
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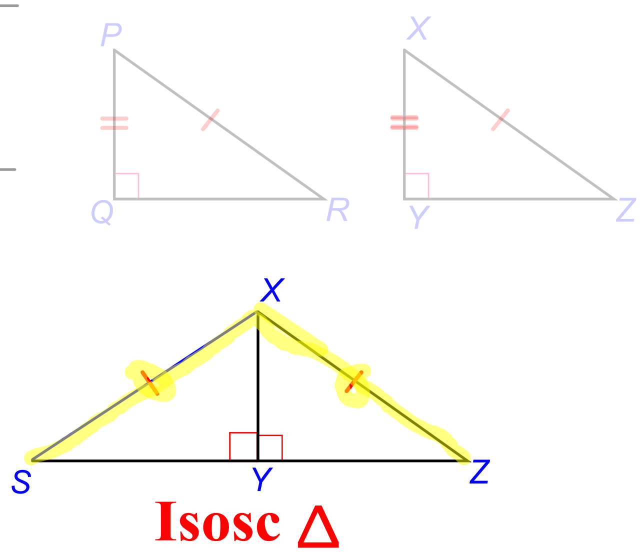
$\Delta PQR \cong \Delta XYS$	SAS
$\overline{PR} \cong \overline{XS}$	CPCTC
$\overline{XS} \cong \overline{XZ}$	trans POC
ΔSXZ is isosceles	defn isos Δ



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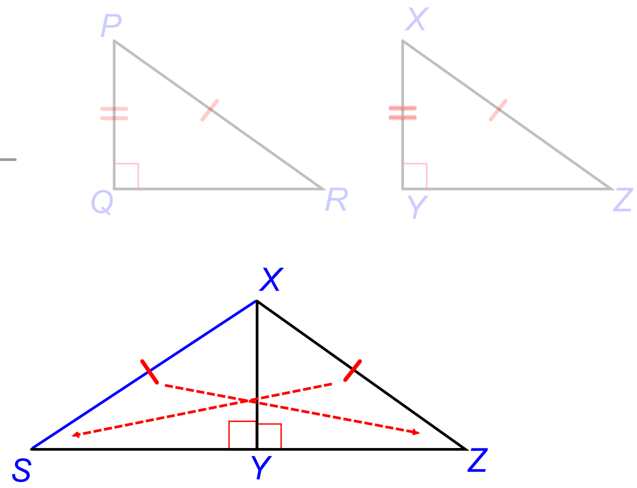

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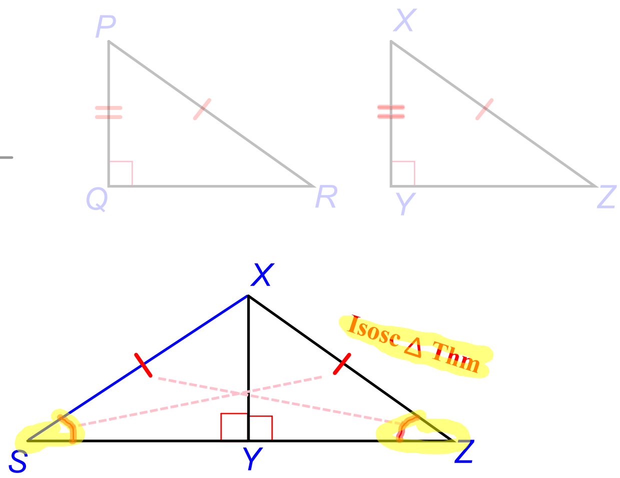
$\angle S \cong \angle Z$	Isos Δ Thm



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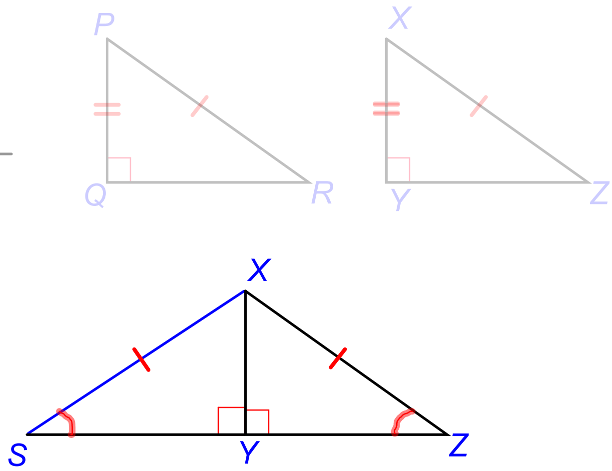

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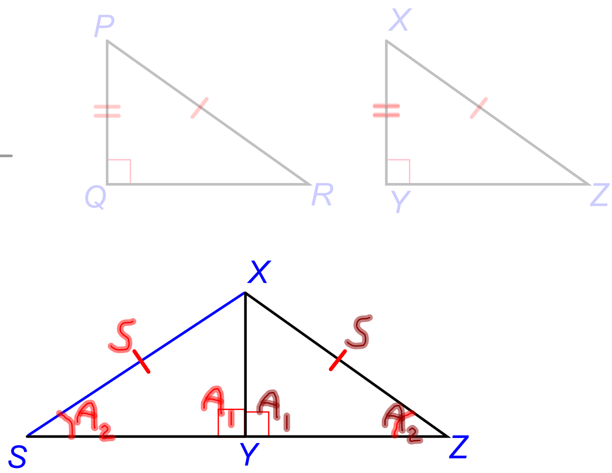

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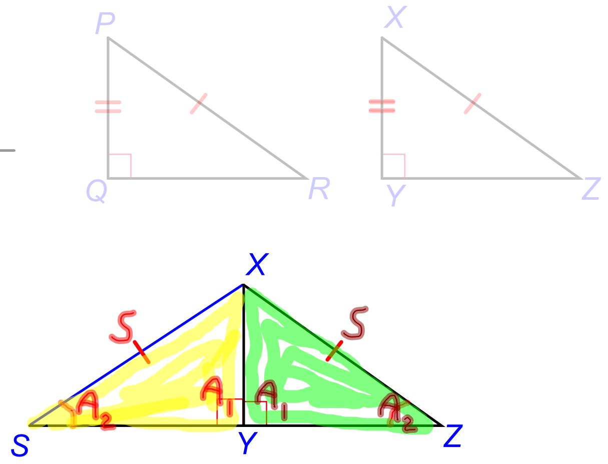
Prove $\Delta PRQ \cong \Delta XZY$



Construct $\overrightarrow{ZY}$
Mark S on $\overrightarrow{ZY}$ so $\overline{YS} \cong \overline{QR}$

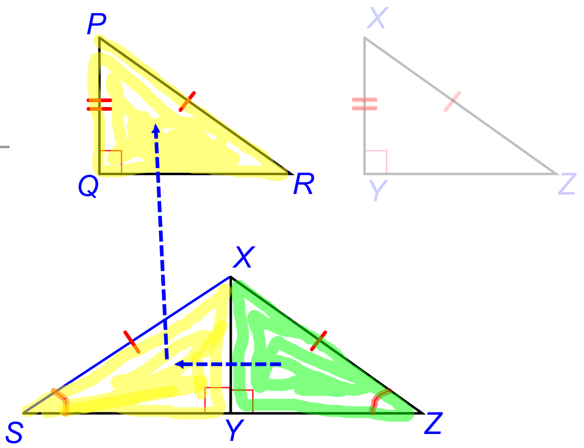
$\angle PQR \cong \angle XYS$	all rt $\angle$'s $\cong$
$\overline{PQ} \cong \overline{XY}$	given
$\Delta PQR \cong \Delta XYS$	SAS
$\overline{PR} \cong \overline{XS}$	CPCTC
$\overline{XS} \cong \overline{XZ}$	trans POC
ΔSXZ is isosceles	defn isos Δ
$\angle S \cong \angle Z$	Isos Δ Thm
$\Delta XYS \cong \Delta XYZ$	AAS

Given $\overline{PR} \cong \overline{XZ}$

$\overline{PQ} \cong \overline{XY}$

$\angle Q$ & $\angle Y$ are rt $\angle$'s

Prove $\Delta PRQ \cong \Delta XZY$



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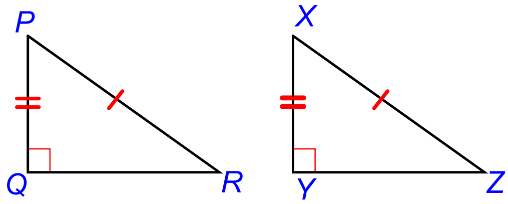
ΔSXZ is isosceles	defn isos Δ
$\angle S \cong \angle Z$	Isos Δ Thm
$\Delta XYS \cong \Delta XYZ$	AAS
$\therefore \Delta PQR \cong \Delta XYZ$	trans POC

Given $\overline{PR} \cong \overline{XZ}$

$\overline{PQ} \cong \overline{XY}$

$\angle Q$ & $\angle Y$ are rt $\angle$'s

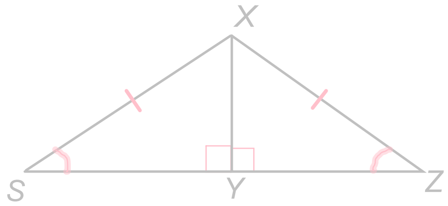
Prove $\Delta PRQ \cong \Delta XZY$



Construct $\overrightarrow{ZY}$

Mark S on $\overrightarrow{ZY}$ so $\overline{YS} \cong \overline{QR}$

$\angle PQR \cong \angle XYS$	all rt$\angle$'s $\cong$
$\overline{PQ} \cong \overline{XY}$	given
$\Delta PQR \cong \Delta XYS$	SAS
$\overline{PR} \cong \overline{XS}$	CPCTC
$\overline{XS} \cong \overline{XZ}$	trans POC
ΔSXZ is isosceles	defn isos Δ
$\angle S \cong \angle Z$	Isos Δ Thm
$\Delta XYS \cong \Delta XYZ$	AAS
$\therefore \Delta PQR \cong \Delta XYZ$	trans POC



QED

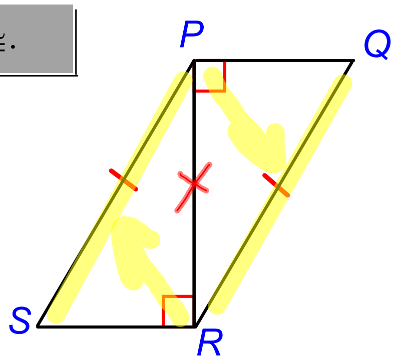
To use the HL Theorem, need to show:

1) The 2 Δ's are rt Δ's

2) Hyp $\cong$

3) 1 pair legs $\cong$

Example - Pg 219 #2: Explain why the 2 Δ's are ≅.



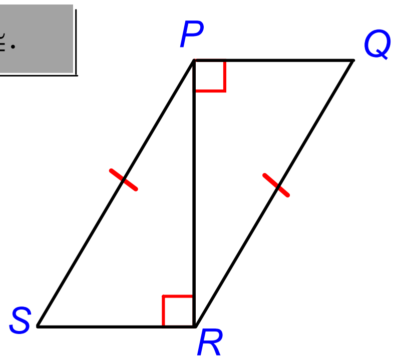
$\overline{PR} \cong \overline{PR}$ ← ≅ Legs

$\overline{SP} \cong \overline{RQ}$ ← ≅ Hyp

∠SRP, ∠RPQ rt ∠'s ← RT Δ's

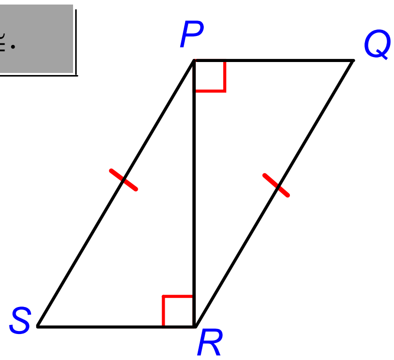
≅ by HL

Example - Pg 219 #2: Explain why the 2 Δ's are ≅.



Δ*SRP* ≅ Δ*QPR* by HL Thm

Example - Pg 219 #2: Explain why the 2 Δ's are ≅.



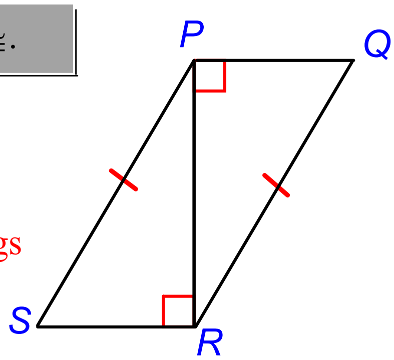
$\Delta SRP \cong \Delta QPR$ by HL Thm

1) Show rt Δ's:

2) Show hyp ≅:

3) Show legs ≅

Example - Pg 219 #2: Explain why the 2 Δ's are ≅.



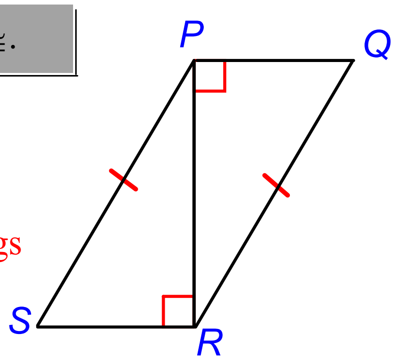
$\Delta SRP \cong \Delta QPR$ by HL Thm

1) Show rt Δ's: $\angle SRP, \angle QPR$ $rt \angle$'s markings

2) Show hyp ≅

3) Show legs ≅

Example - Pg 219 #2: Explain why the 2 Δ's are ≅.



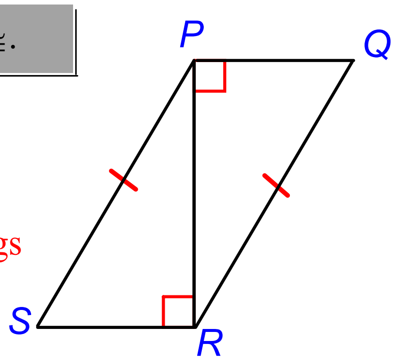
$\Delta SRP \cong \Delta QPR$ by HL Thm

1) Show rt Δ's: $\angle SRP, \angle QPR$ $rt\angle$'s markings

2) Show hyp ≅: $SP \cong RQ$ given

3) Show legs ≅:

Example - Pg 219 #2: Explain why the 2 Δ's are ≅.



$\Delta SRP \cong \Delta QPR$ by HL Thm

1) Show rt Δ's: $\angle SRP, \angle QPR$ $rt\angle$'s markings

2) Show hyp ≅: $SP \cong RQ$ given

3) Show legs ≅: $PR \cong PR$ refl POC

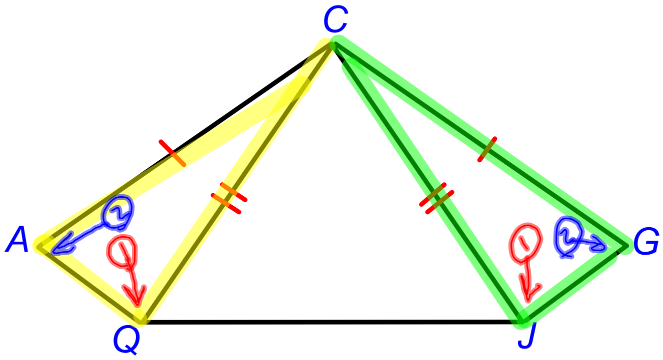
Example - Pg 219 #8: What additional info need to prove $\Delta ACQ \cong \Delta GCJ$ by HL?

Need rt ∠'s

∠AQC, ∠CJG rt ∠'s

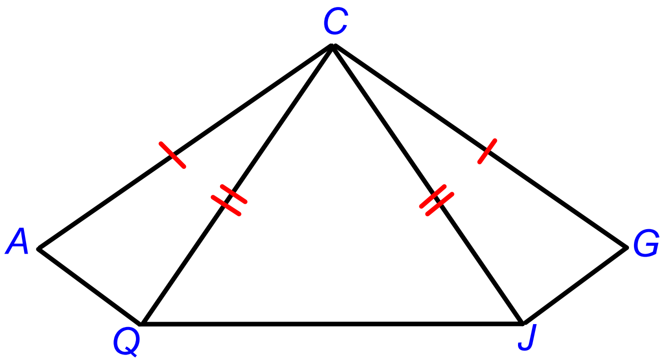
or

∠CAQ, ∠CGJ rt ∠'s



Example - Pg 219 #8: What additional info need to prove $\Delta ACQ \cong \Delta GCJ$ by HL?

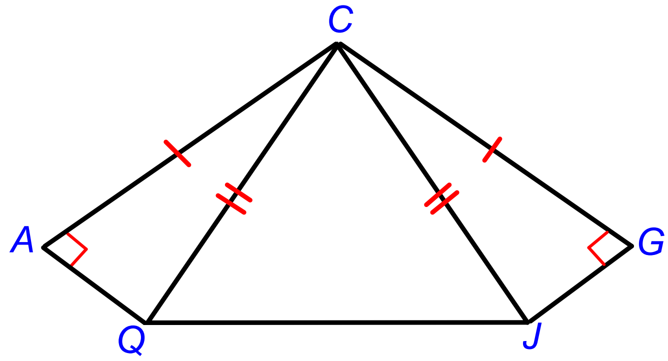
Need rt Δ's



Example - Pg 219 #8: What additional info need to prove $\Delta ACQ \cong \Delta GCJ$ by HL?

Need rt Δ's

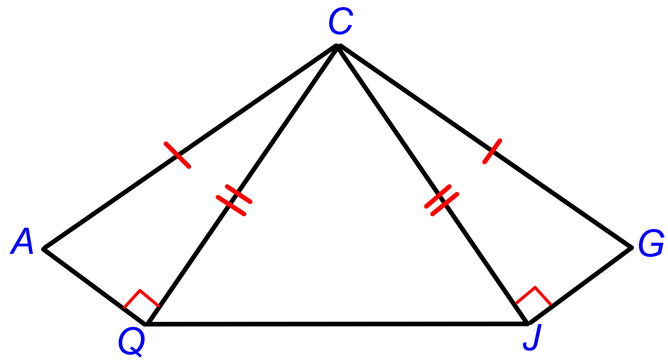
$\angle A$ & $\angle G$



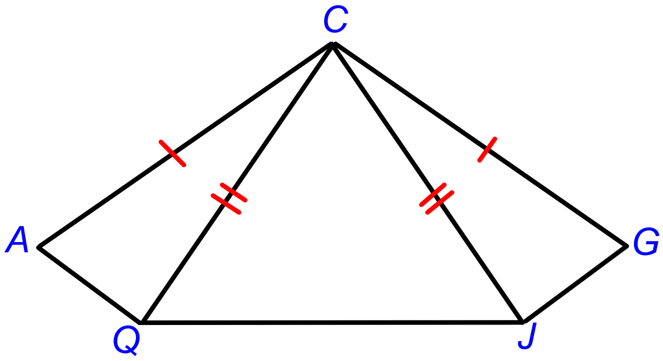
Example - Pg 219 #8: What additional info need to prove $\Delta ACQ \cong \Delta GCJ$ by HL?

Need rt Δ's

$\angle A$ & $\angle G$ or $\angle Q$ & $\angle J$



Example - Pg 219 #8: What additional info need to prove $\Delta ACQ \cong \Delta GCJ$ by HL?



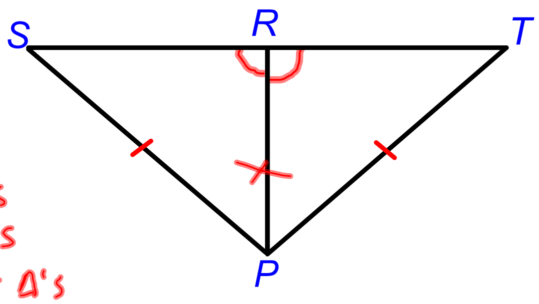
Need rt Δ's

$\angle A$ & $\angle G$	or	$\angle Q$ & $\angle J$
CQ, CJ } hyp		AC, CG } hyp
AC, CG } leg		CQ, CJ } leg

Example - Pg 219 #12: Complete the proof

Given $PS \cong PT$ and $\angle PRS \cong \angle PRT$

Prove $\Delta PRS \cong \Delta PRT$



① RT Δ's : $\angle SRP$, $\angle TRP$ are RT ∠'s → ≅ supplements
∴ ΔSRP, ΔTRP RT Δ's

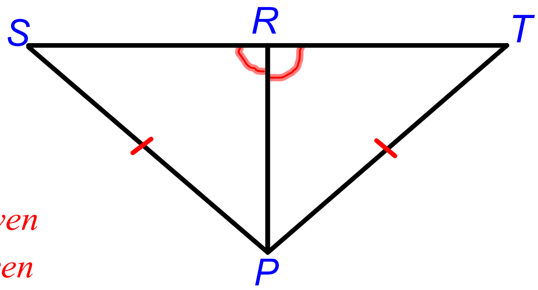
② ≅ Hyp: $\overline{SP}$, $\overline{PT}$ are hyp (opp RT ∠'s)
$\overline{SP} \cong \overline{PT}$ given (markings)

③ ≅ Legs: $\overline{PR} \cong \overline{PR}$ Refl POC

Example - Pg 219 #12: Complete the proof

Given $PS \cong PT$ and $\angle PRS \cong \angle PRT$

Prove $\Delta PRS \cong \Delta PRT$



$\angle PRS \cong \angle PRT$	given
$\angle PRS, \angle PRT$ are supplemental	given
$\angle PRS, \angle PRT$ are rt $\angle$'s	Thm 2-5
ΔPRS & ΔPRT are rt Δ's	defn rt Δ
$\overline{SP} \cong \overline{PT}$ (hypotenuses)	given
$\overline{PR} \cong \overline{PR}$ (legs)	refl POC
$\therefore \Delta PRS \cong \Delta PRT$	HL

QED

Again - to use the HL Theorem, show

1) The 2 Δ's are rt Δ's

2) Hyp $\cong$

3) 1 pair legs $\cong$

L4-6 HW Problems

Pg 219 #1-11 odd,
14-17,
19, 20, 28, 31,
35-46