Triangle Congruence

Chapter 4

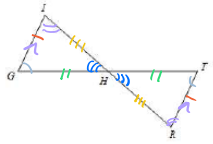
Review 1

For each proof, mark the picture and complete the proof.

#1)

Given: $\overline{GI} \parallel \overline{TR}$
H is the midpoint of $\overline{GT}$
$\overline{GI} \cong \overline{RT}$
$\overline{HR} \cong \overline{IH}$

Prove: $\Delta GHI \cong \Delta THR$

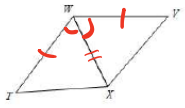


STATEMENTS	REASONS
1. $\overline{GI} \parallel \overline{TR}$, H is the midpoint of $\overline{GT}$, $\overline{GI} \cong \overline{RT}$, $\overline{HR} \cong \overline{IH}$	1. Given
2. $\overline{GH} \cong \overline{HT}$	2. Midpoint Th'm
3. $\angle G \cong \angle T$	3. Alternate Interior Angles are congruent Theorem
4. $\angle I \cong \angle R$	4. Alt Int $\angle$ Theorem
5. $\angle IHG \cong \angle RHT$	5. Vertical $\angle$s Theorem
6. $\Delta GHI \cong \Delta THR$	6. Definition of Congruent Triangles

#2)

Given: $\angle TWX \cong \angle VWX$
$\overline{TW} \cong \overline{WV}$

Prove: $\Delta XWV \cong \Delta XWT$

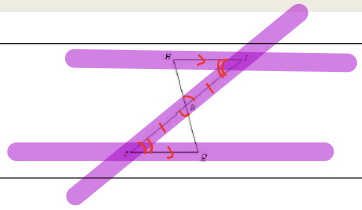


STATEMENTS	REASONS
$\angle TWX \cong \angle VWX$, $\overline{TW} \cong \overline{WV}$	Given
$\overline{WX} \cong \overline{WX}$	Congruence of Segments is Reflexive (or Reflexive prop of $\cong$)
$\Delta XWV \cong \Delta XWT$	SAS $\cong$ Postulate

#3)

Given: R is the midpoint of $\overline{SI}$
$\overline{HI} \parallel \overline{SQ}$

Prove: $\Delta RQS \cong \Delta RHI$

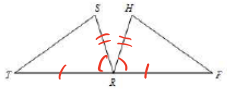


STATEMENTS	REASONS
R is the midpoint of $\overline{SI}$, $\overline{HI} \parallel \overline{SQ}$	Given
$\overline{SR} \cong \overline{RI}$	Midpoint Th'm
$\angle HRI \cong \angle QRS$	vertical $\angle$'s Theorem
$\angle I \cong \angle S$	Alt. Int. $\angle$s Theorem
$\Delta RQS \cong \Delta RHI$	ASA $\cong$ Post

#4)

Given: $\angle SRT \cong \angle HRF$
R is the midpoint of $\overline{TF}$
$\overline{SR} \cong \overline{HR}$

Prove: $\Delta TSR \cong \Delta FRH$



STATEMENTS	REASONS
$\angle SRT \cong \angle HRF$, R is the midpoint of $\overline{TF}$, $\overline{SR} \cong \overline{HR}$	Given
$\overline{TR} \cong \overline{RF}$	Midpoint Th'm
$\Delta TSR \cong \Delta FRH$	SAS $\cong$ Postulate

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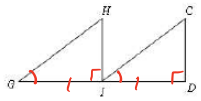
Review 1

#5)

Given: $\angle HGI \cong \angle CID$
$\angle CDI$ is a right angle
$\overline{HI}$ is the perpendicular bisector of $\overline{GD}$

Prove: $\Delta HGI \cong \Delta CID$

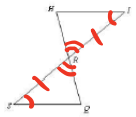


STATEMENTS	REASONS
$\angle HGI \cong \angle CID$, $\angle CDI$ is a right angle, $\overline{HI}$ is the $\perp$ bisector of $\overline{CD}$	Given
$\angle HIG$ is a right angle	Def'n of $\perp$
$\angle GIH \cong \angle IDC$	All right angles are congruent
$\overline{GI} \cong \overline{ID}$	Def'n of bisector
$\Delta HGI \cong \Delta CID$	ASA $\cong$ Postulate

#6)

Given: R is the midpoint of $\overline{SI}$
$\angle S \cong \angle I$

Prove: $\angle Q \cong \angle H$

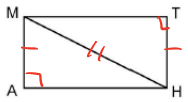


STATEMENTS	REASONS
R is the midpoint of $\overline{SI}$, $\angle S \cong \angle I$	Given
$\overline{SR} \cong \overline{RI}$	Midpoint Thm
$\angle HRI \cong \angle SRQ$	Vertical $\angle$s Theorem
$\Delta SRQ \cong \Delta IRH$	ASA $\cong$ Postulate
$\angle Q \cong \angle H$	CPCTC

#7)

Given: $\angle A$ and $\angle T$ are right angles
$\overline{MA} \cong \overline{TH}$

Prove: $\angle MHA \cong \angle HMT$

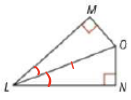


STATEMENTS	REASONS
$\angle A$ and $\angle T$ are right angles, $\overline{MA} \cong \overline{TH}$	Given
$\angle A \cong \angle T$	All right angles are congruent
$\overline{MH} \cong \overline{MH}$	Congruence of Segments is reflexive
ΔMAH & ΔHTA are right Δs	Def'n of right Δ
$\Delta MAH \cong \Delta HTM$	HL Theorem
$\angle MHA \cong \angle HMT$	CPCTC

#8)

Given: $\overline{LO}$ bisects $\angle MLN$, $\overline{OM} \perp \overline{LM}$, $\overline{ON} \perp \overline{LN}$

Prove: $\Delta LMO \cong \Delta LNO$



STATEMENTS	REASONS
$\overline{LO}$ bisects $\angle MLN$, $\overline{OM} \perp \overline{LM}$, $\overline{ON} \perp \overline{LN}$	Given
$\angle MLO \cong \angle OLN$	Def'n of bisects
$\angle M$ is a right angle, $\angle N$ is a right angle	Def'n of $\perp$
$\angle M \cong \angle N$	All Right Angles are $\cong$
$\overline{LO} \cong \overline{LO}$	Congruence of Segments is reflexive
$\Delta LMO \cong \Delta LNO$	AAS $\cong$ Postulate

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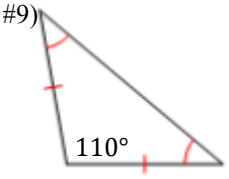
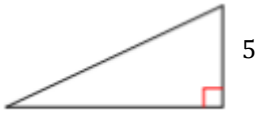
Classify each triangle by its sides and angles.

#9)



Obtuse Isosceles Δ

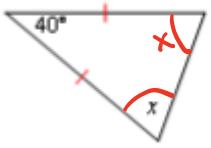
#10)



Scalene right Δ

Find the value of x.

#11)



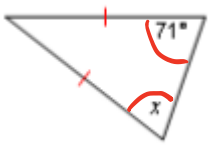
$40 + x + x = 180$

$2x + 40 = 180$

$2x = 140$

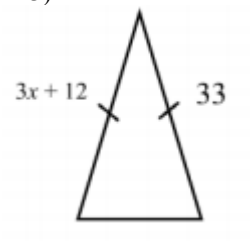
$x = 70$

#12)



$x = 71$

#13)



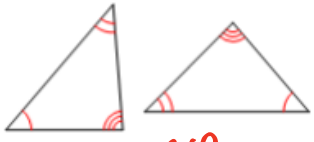
$3x + 12 = 33$

$3x = 21$

$x = 7$

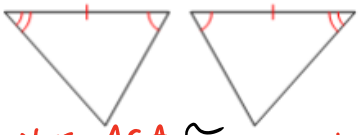
State if the two triangles are congruent. If they are, state how you know.

14)



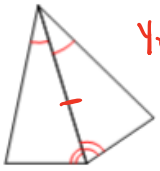
NO

15)



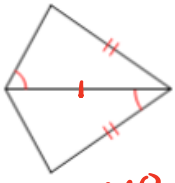
Yes, ASA ≅ Postulate

16)



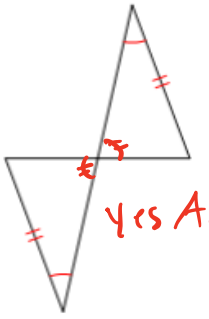
Yes, ASA ≅ Post

17)



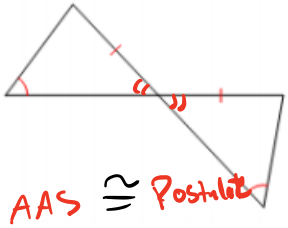
NO

18)



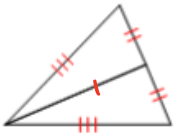
Yes AAS ≅

19)



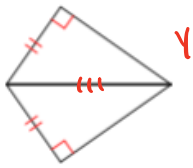
Yes AAS ≅ Postulate

20)



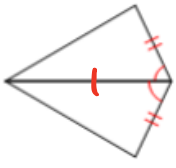
Yes SSS ≅ postulate

21)



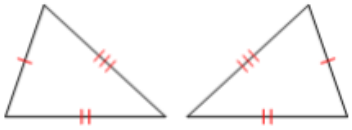
Yes HL Theorem

22)



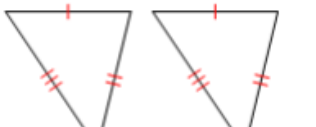
Yes SAS ≅ Postulate

23)



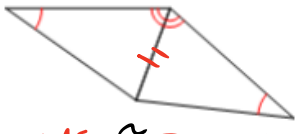
Yes SSS ≅ Postulate

24)



Yes SSS ≅ Postulate

25)



Yes AAS ≅ Postulate

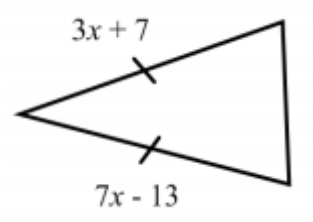
Triangle Congruence

Chapter 4

Review 1

Find the value of x.

#26)



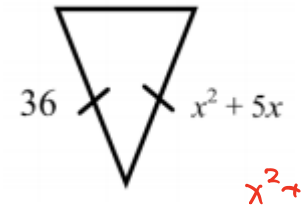
$3x+7 = 7x-13$

$7 = 4x-13$

$20 = 4x$

$5 = x$

#27)



$x^2+5x = 36$

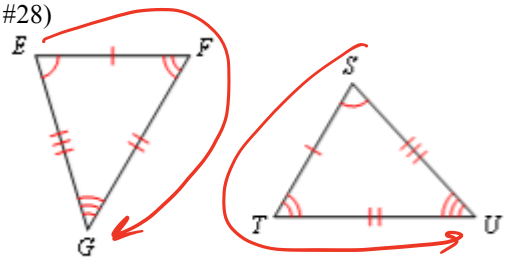
$x^2+5x-36=0$

$(x+9)(x-4)=0$

$x+9=0$ $\quad x=-9$ $\qquad$ $x-4=0$ $\quad x=4$

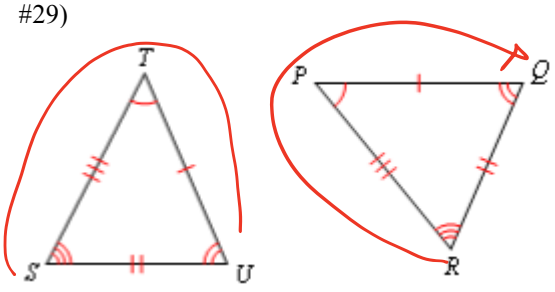
Finish the congruence statement.

#28)



$\Delta EFG \cong$ ΔSTU

#29)



$\Delta STU \cong$ ΔRPQ