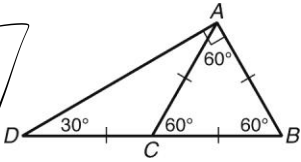


**Study Guide: Triangle Congruence – on sections 4.1-4.5 and 5.5**

Classify triangles both by their side lengths and their angle measures.

*either: acute, right, or obtuse*

§4.1



1. Classify  $\triangle ABD$  by its angle measures: right

2. Classify  $\triangle ABC$  by its side lengths: equilateral

*either: scalene, isosceles, or equilateral*

Prove and use theorems about triangles, including angle sum, exterior angle, third angles.

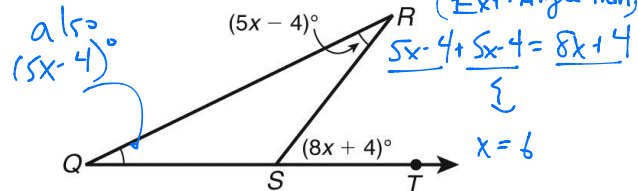
3. The measure of the smallest angle of a right triangle is  $27^\circ$ . What is the measure of the remaining angle?  $63^\circ$

§4.2

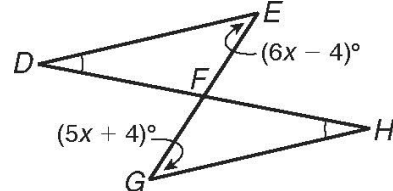
4. In  $\triangle POW$ , angle P measures  $2x$ , angle O measures  $3x-15$ , and angle W measures  $4x-30$ . Find the actual measures of each angle.  $50, 80, 70$

$2x + 3x - 15 + 4x - 30 = 180$

5. Find the value of  $\angle RST$ .  $52$



*(Exl. Angle Thm)*  
 $5x - 4 + 5x - 4 = 8x + 4$   
 $x = 6$



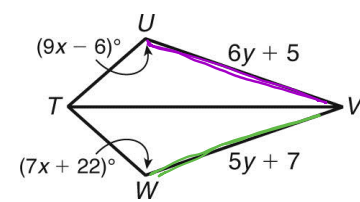
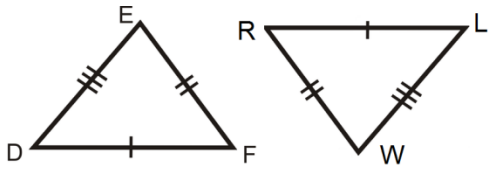
$44^\circ$  *Third Angle Theorem*  
 $6x - 4 = 5x + 4$   
 $x = 8$   
 $6(8) - 4 = 44$

Define congruence in terms of identical and matching parts.

7. Complete the congruence statement:  $\triangle DEF \cong \triangle LWR$

8.  $\triangle TUV \cong \triangle TWV$ . Find UV.  $17$

§4.3



$6y + 5 = 5y + 7$   
 $-5y$   
 $y + 5 = 7$   
 $y = 2 \rightarrow 6(2) + 5 = 17$

Determine whether 3 given lengths will make a  $\triangle$ . Specify a range of values for the 3rd side of a  $\triangle$  given 2 lengths.

§5.5

9. Three sides of a triangle measure  $x^2$ ,  $6x-1$ , and  $2x$ . When  $x = 3$ , will the lengths form a triangle? No

$3^2 = 9$   
 $6(3) - 1 = 17$   
 $2(3) = 6$   
 $9 + 6 = 15 > 17$ ? NO  
*"the sum of 2 smaller sides of a  $\triangle$  must be greater than the length of the third side."*

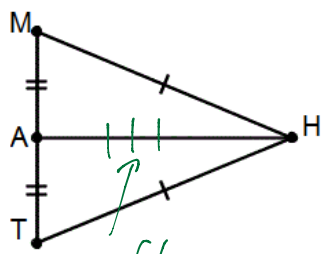
10. Two sides of a triangular frame measure 3.5mm and 11.03mm. What is the range of possible values for the third side?

$11.03 + 3.5 = 14.53$   
 $11.03 - 3.5 = 7.53$   
 $7.53 < x < 14.53$

Prove triangles congruent using the shortcuts SSS/SAS/ASA/AAS. Recognize that AAA and SSA do not work.

§4.4

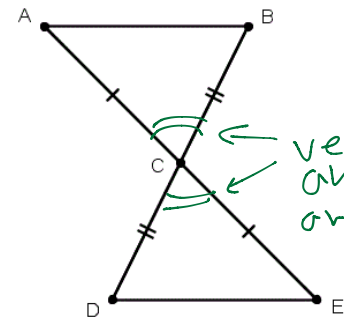
11. Which of the 4 congruence shortcuts can be used to show that  $\triangle MAH \cong \triangle TAH$ ? SSS



*reflexive property*

- ①  $\overline{MA} = \overline{TA}$
  - ②  $\overline{MH} \cong \overline{TH}$
  - ③  $\overline{AH} \cong \overline{AH}$  reflexive
- So SSS

12. Which of the 4 congruence shortcuts can be used to show these triangles below are congruent? SAS



*vertical angles are  $\cong$*

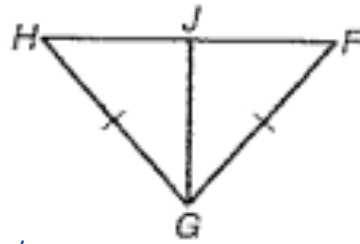
13. Complete the congruence statement:

$\triangle ACB \cong \triangle ECD$

Develop basic geometric proofs using statements and reasons.

14. Fill in the blank for statements and reasons.

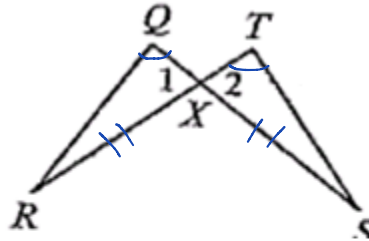
Given: J is the midpoint of HF;  $FG \cong HG$ .  
 Prove:  $\triangle FGJ \cong \triangle HGJ$



Statements	Reasons
1. J is the midpoint of HF	1. <u>Given</u>
2. $HJ \cong FJ$	2. Def. of midpoint
3. $JG \cong JG$	3. <u>Reflexive Property</u>
4. $FG \cong HG$	4. Given
5. $\triangle FGJ \cong \triangle HGJ$	5. <u>S.S.S.</u>

15.

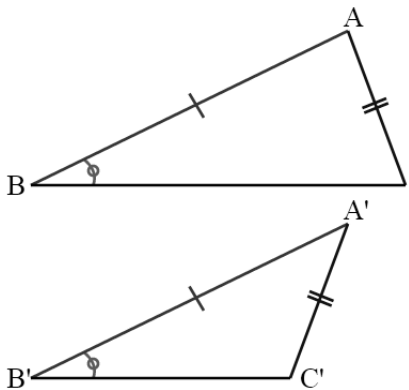
Given:  $\angle Q \cong \angle T$ ;  $\overline{RX} \cong \overline{SX}$ .  
 Prove:  $\triangle RXQ \cong \triangle SXT$ .



§4.5

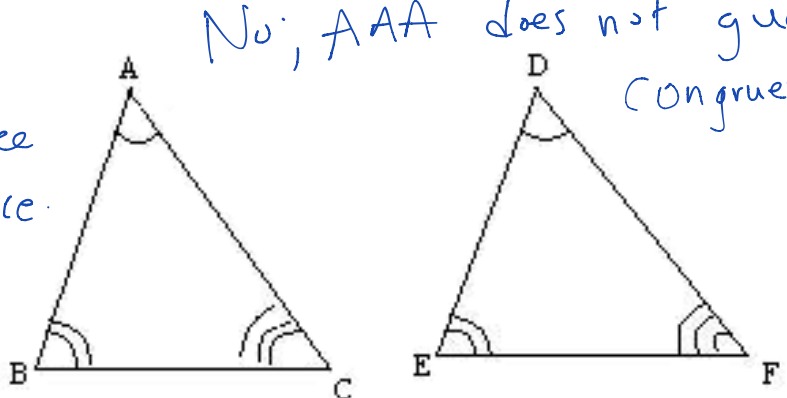
Statements	Reasons
1. $\angle Q \cong \angle T$	1. <u>Given</u>
2. $RX \cong SX$	2. <u>Given</u>
3. $\angle 1 \cong \angle 2$	3. <u>Vertical Angles</u>
4. $\triangle RXQ \cong \triangle SXT$	4. <u>AAS</u>

16. Are these triangles congruent? Why or why not?



No; SSA does not guarantee congruence.

17. Are these triangles congruent? Why or why not?



No; AAA does not guarantee congruence.