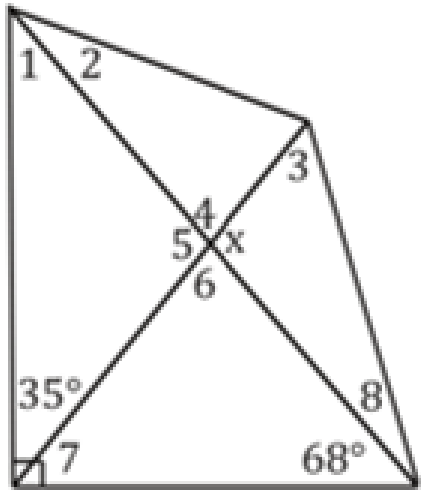
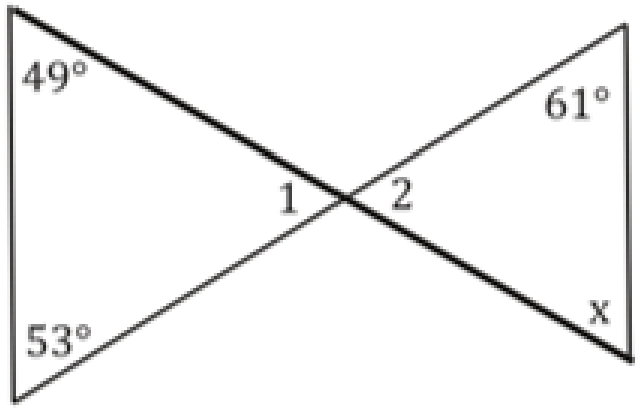
WARM UP

Tuesday, November 11, 2014

1.) Find the value of x.



2.) Find the value of x



3.) Convert $f(x) = log_7(2x + 3)$

1 2 3 4 5 6 7 8 9 10

Objectives

Use triangle congruency theorems to determine if triangles are congruent.

Prove by two column proof that two triangles are congruent using the triangle congruency theorems.

Homework

Triangle packet, sections I and II, all problems.

Grading Policy for this unit.

Warm-ups will be collected daily and accumulated into one warm-up grade for the unit.

Homework is due the day after it is assigned. A 10 point reduction will be assessed for each day late.

Your 7 homework assignments will be averaged into a single homework grade for the entire unit.

ALL Make Up Tests for the Log and Exponents Unit must be completed by Friday November 14th .
No exceptions.

ALL Retakes for the Log and Exponents Unit must be completed by Friday November 21st.

No exceptions.

Sign Up on the Make-up/Retake Log with the date you intend to take the test.

You MUST bring your test corrections with you to be eligible for a retake.

Homework questions?

2. Given: $m\angle 1 + m\angle 2 = 90$

Conclusion: $m\angle 1 = 90 - m\angle 2$
Subtraction Property

4. Given: $q - x = r$

Conclusion: $4(q - x) = 4r$
Multiplication Property

6. Given: $CD = AF - 2CD$

Conclusion: $3CD = AF$
Addition Property

8. Given: $m\angle AOX = 2m\angle XOB$

$2m\angle XOB = 140$

Conclusion: $m\angle AOX = 140$
Substitution Prop.

of.

10. $\overline{RT} \cong \overline{RT}$ **b**

11. If $\angle YER \cong \angle IOP$ **f**
and $\angle IOP \cong \angle WXZ$
then $\angle YER \cong \angle WXZ$

12. If $\overline{PQ} \cong \overline{MN}$ **d**
then $\overline{MN} \cong \overline{PQ}$

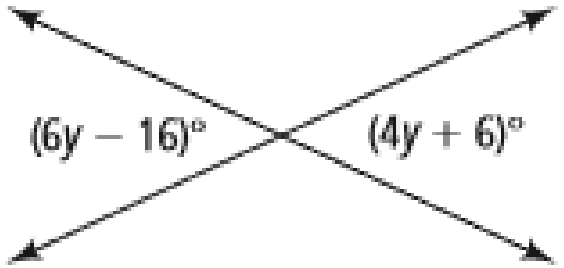
13. If $XT = YZ$ **e**
and $YZ = UP$
then $XT = UP$

14. $m\angle 1 = m\angle 1$ **a**

15. If $m\angle RQS = m\angle TEF$ **c**
then $m\angle TEF = m\angle RQS$

Homework questions?

2.



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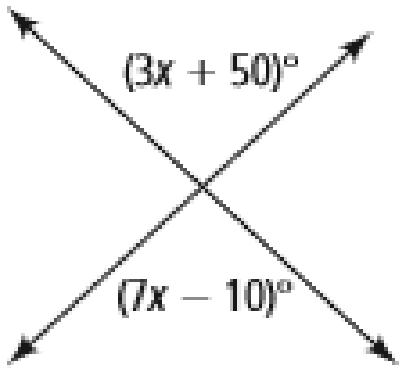
3.



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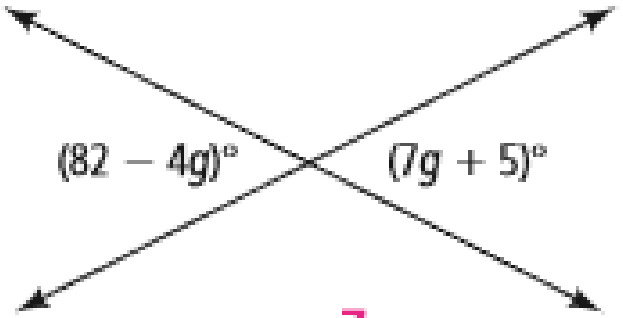
4.



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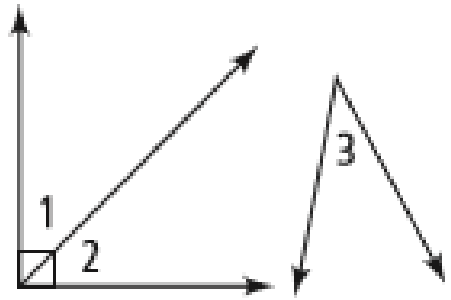
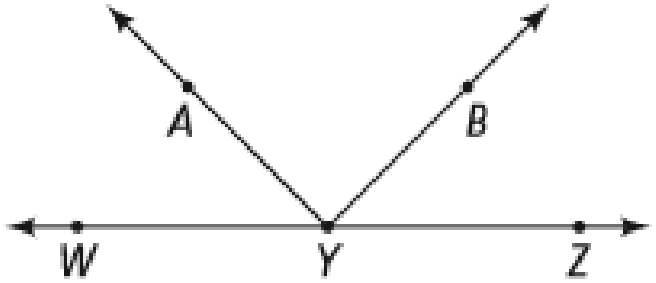
5. **Given:** $\angle 2$ is complementary to $\angle 3$.



$\angle 1 \cong \angle 3$; Congruent Complements Theorem

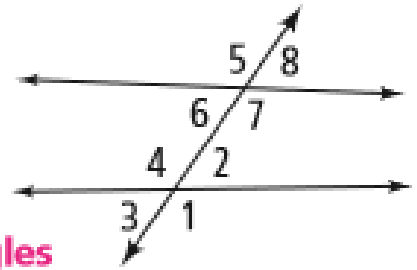
6. **Given:** $\angle AYZ \cong \angle BYW$



$\angle AYW \cong \angle BYZ$; Congruent Supplements Theorem

Homework questions?

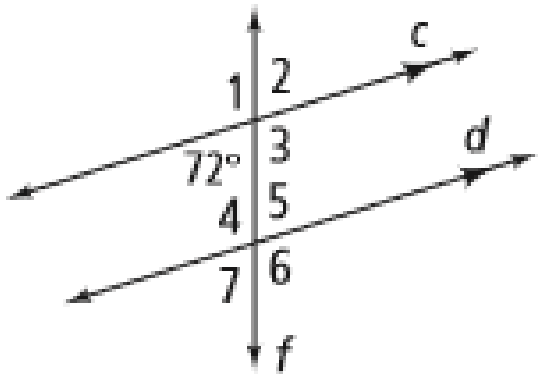
Use the diagram at the right to answer Exercises 16 and 17. Decide whether the angles are *alternate interior angles, same-side interior angles, corresponding,* or *alternate exterior angles.*



16. $\angle 1$ and $\angle 5$
alternate exterior angles

17. $\angle 4$ and $\angle 6$
same-side interior angles

2.

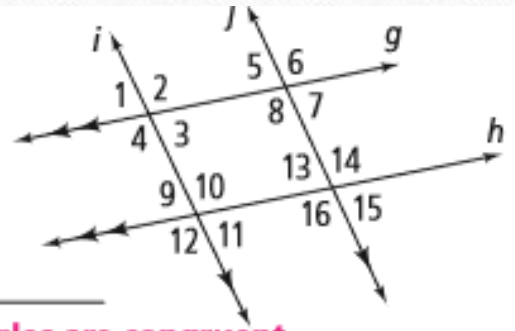


∠2; vert. ∡s are ≅; ∠5; alt. int. ∡s are ≅; ∠7; corresp. ∡s are ≅.

4. Supply the missing reasons in the two-column proof.

Given: $g \parallel h$, $i \parallel j$

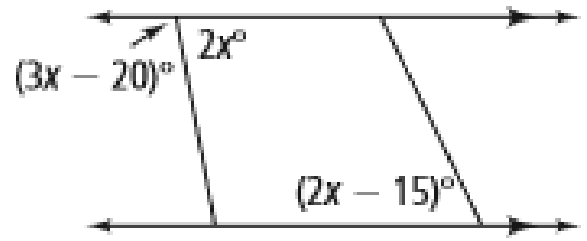
Prove: $\angle 1$ is supplementary to $\angle 16$.



Statements	Reasons
1) $\angle 1 \cong \angle 3$	1) ? Vertical angles are congruent.
2) $g \parallel h$; $i \parallel j$	2) Given
3) $\angle 3 \cong \angle 11$	3) ? Corresponding angles are congruent.
4) $\angle 11$ and $\angle 16$ are supplementary.	4) ? Same-side interior angles are supplementary.
5) $\angle 1$ and $\angle 16$ are supplementary.	5) ? Substitution property

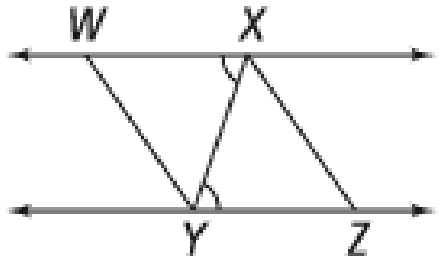
Homework questions?

7.



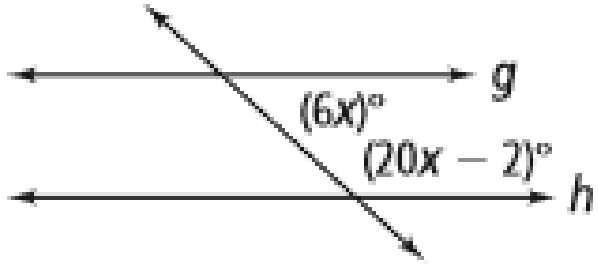
40; 100; 80; 65

2.



$\overline{WX} \parallel \overline{YZ}$ because the ≅ ∡s are alt. int. ∡s.

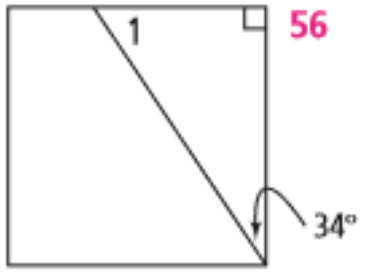
5.



7; 42; 138

Homework questions?

Find $m\angle 1$.

1. 

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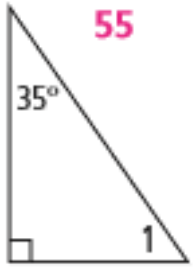
2. 

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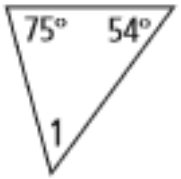
3. 

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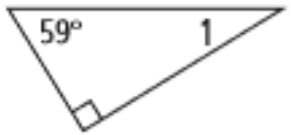
4. 

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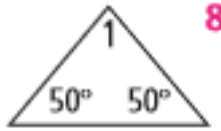
5. 

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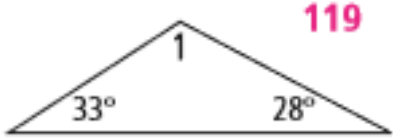
6. 

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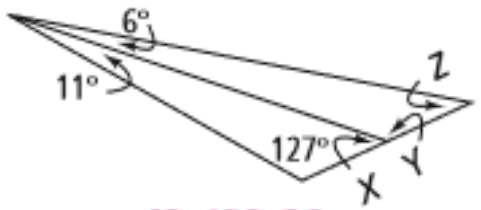
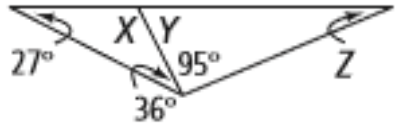
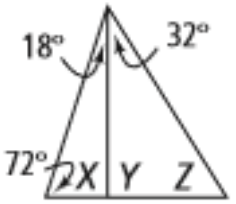
Algebra Find the value of each variable.

7. 

42; 138; 36

8. 

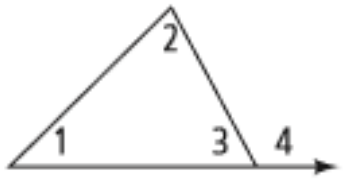
117; 63; 22

9. 

90; 90; 58

Homework questions?

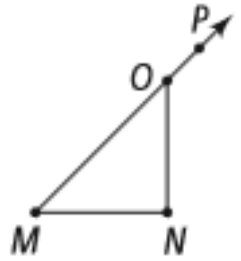
10.



exterior: ∠4

interior: ∠1, ∠2

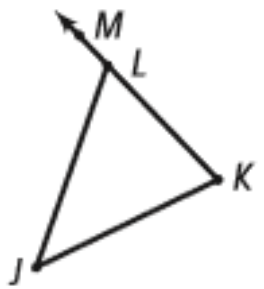
11.



exterior: ∠NOP

interior: ∠OMN, ∠MNO

12.



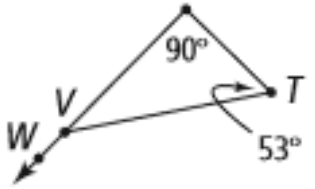
exterior: ∠JLM

interior: ∠JKL, ∠LJK

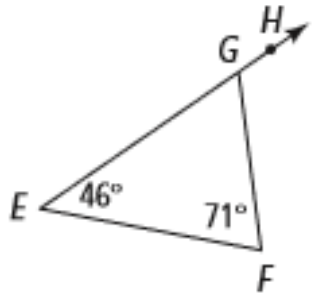
Find the measure of the exterior angle.

13. 115

14. 143



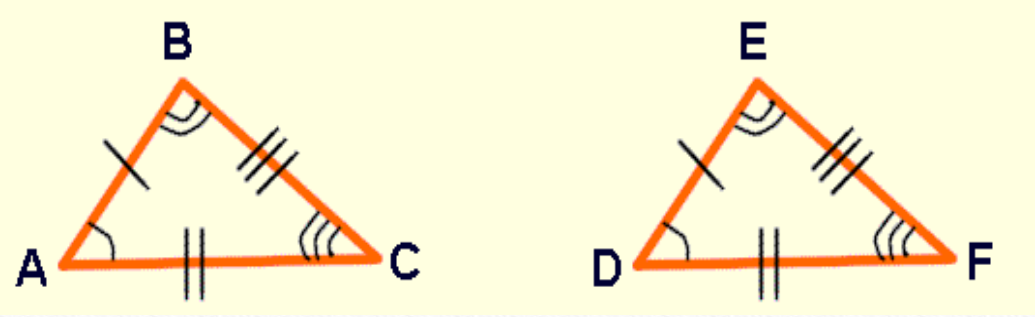
15. 117



Proving Triangles are Congruent

Two triangles are congruent if all three of their angles are of equal measure and each of their corresponding sides have equal length.

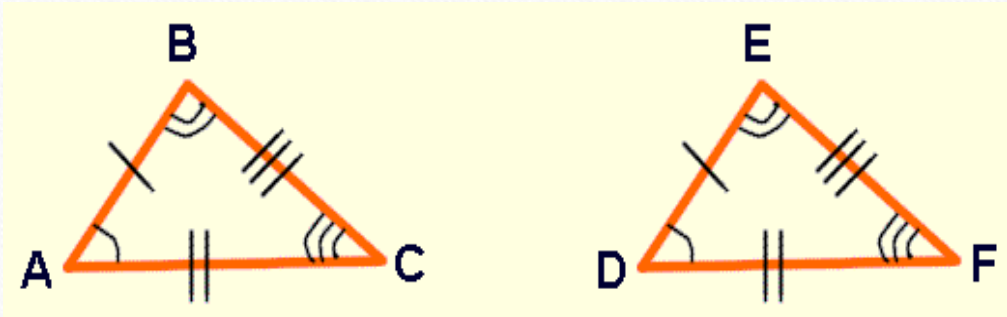
Another way to say that is all their corresponding parts are equal.



How many corresponding parts does a pair of triangles have?

Six, 3 sides and 3 angles.

Proving Triangles are Congruent



The 6 facts for our congruent triangles example:

$\overline{AB} \cong \overline{DE}$ $\quad \measuredangle A \cong \measuredangle D$

$\overline{BC} \cong \overline{EF}$ $\quad \measuredangle B \cong \measuredangle E$

$\overline{AC} \cong \overline{DF}$ $\quad \measuredangle C \cong \measuredangle F$

Because each of the six corresponding parts are equal, we can say that triangle ABC is congruent to triangle DEF.

But I really don't what to prove six things every time I want to prove two triangles are congruent! ☹

Good news!

We have tools that make the proof process quicker and more efficient.

These tools are called the **Triangle Congruency Theorems**

Thanks to these theorems, you only have to prove three corresponding parts are congruent to show that two triangles are congruent.

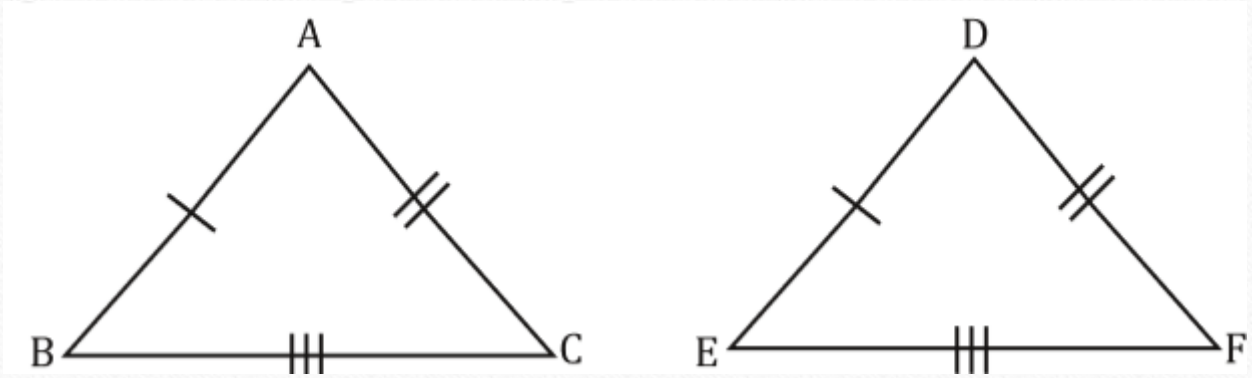
Not awful new!

You have to **memorize** the Triangle Congruency Theorems

THE THEOREMS

SSS – Side Side Side

If three sides of one triangle are congruent to three sides of another triangle, then the two triangles are congruent.

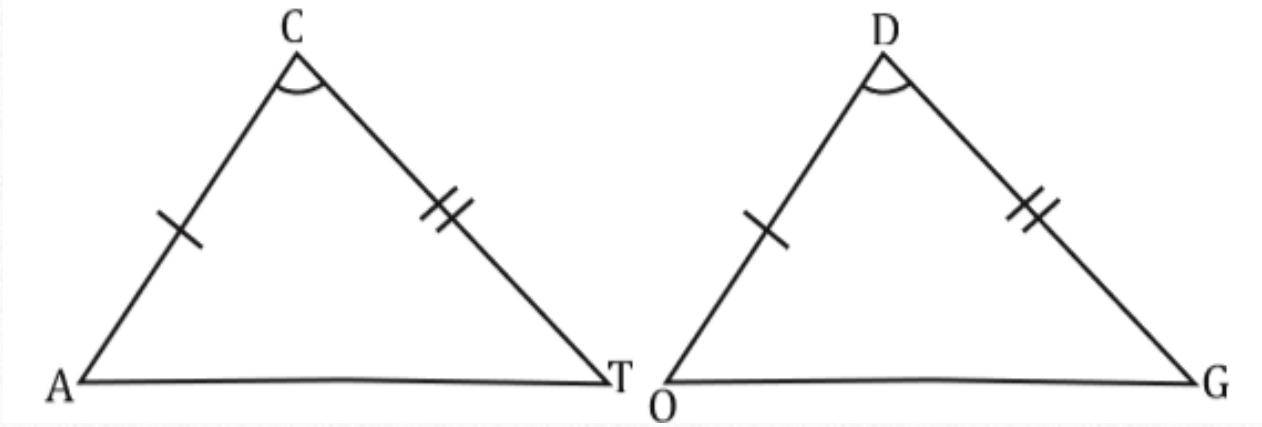


Since $\overline{AB} \cong \overline{DE}$, $\overline{AC} \cong \overline{DF}$, and $\overline{BC} \cong \overline{EF}$ we can say $\Delta ABC \cong \Delta DEF$ by **SSS**.

THE THEOREMS

SAS – Side Angle Side

If two sides and the **included angle** are congruent to two sides and the **included angle** of another triangle, then the triangles are congruent to each other.

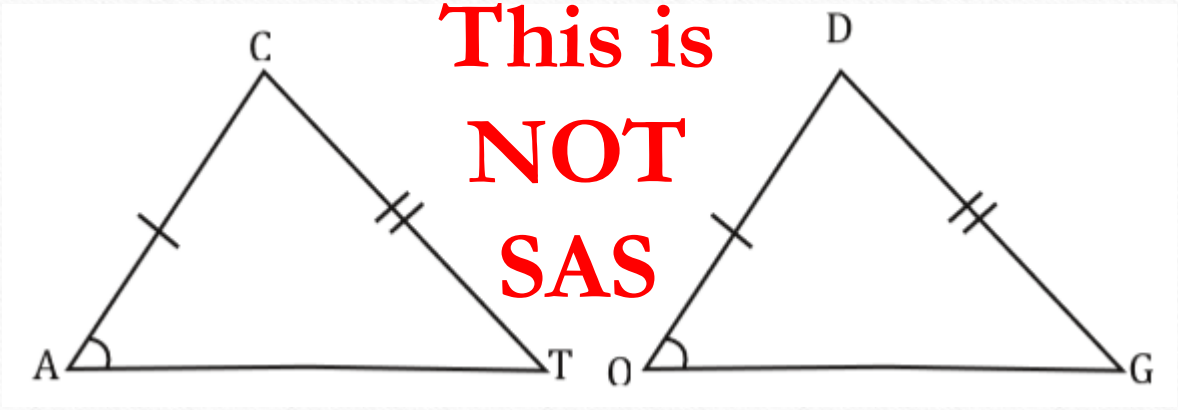


Since $\overline{AC} \cong \overline{OD}$, $\angle C \cong \angle D$, and $\overline{CT} \cong \overline{DG}$ we can say $\Delta ABC \cong \Delta DEF$ by **SAS**.

WARNING

SAS – Side Angle Side

If the angles that are congruent are not BETWEEN the two sides, you DO NOT have SAS. You have ASS!



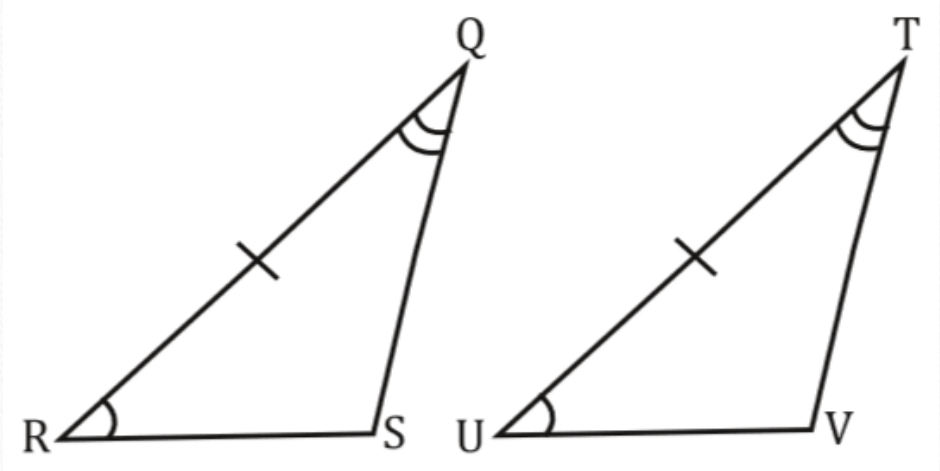
This is NOT SAS

This is ASS!

THE THEOREMS

ASA – Angle Side Angle

If two angles and the **included side** are congruent to two angles and the **included side** of another triangle, then the triangles are congruent to each other.

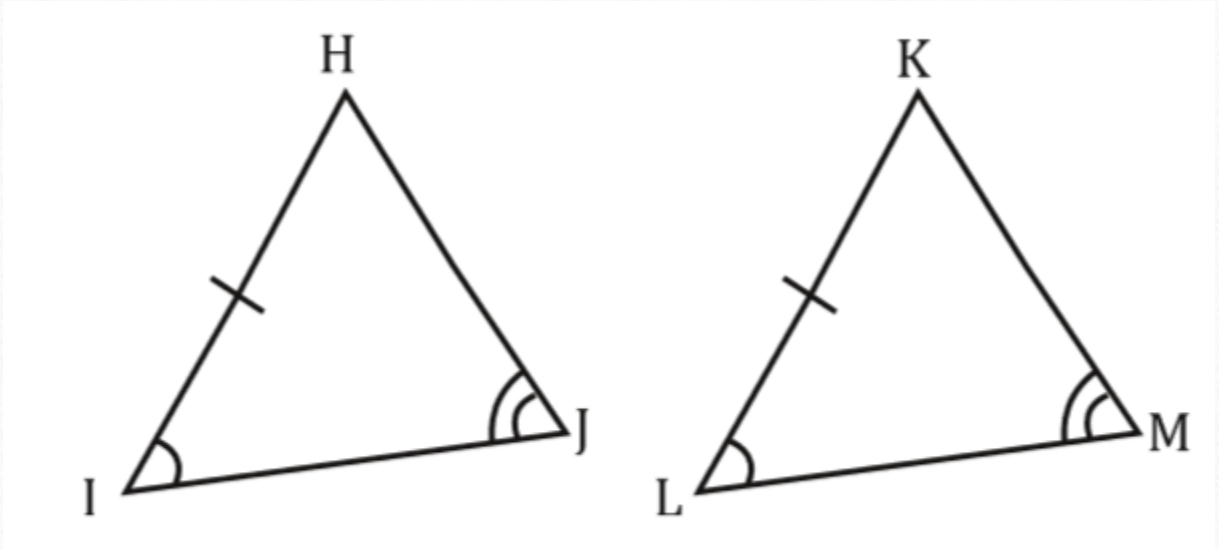


Since $\angle R \cong \angle U$, $\overline{RQ} \cong \overline{UT}$, $\angle Q \cong \angle T$ we can say $\Delta RQS \cong \Delta UTV$ by **ASA**.

THE THEOREMS

AAS – Angle Angle Side

It's really just a form of ASA. *Think about it.* If we know two corresponding angles of a triangle are congruent, the third angle has to be congruent!

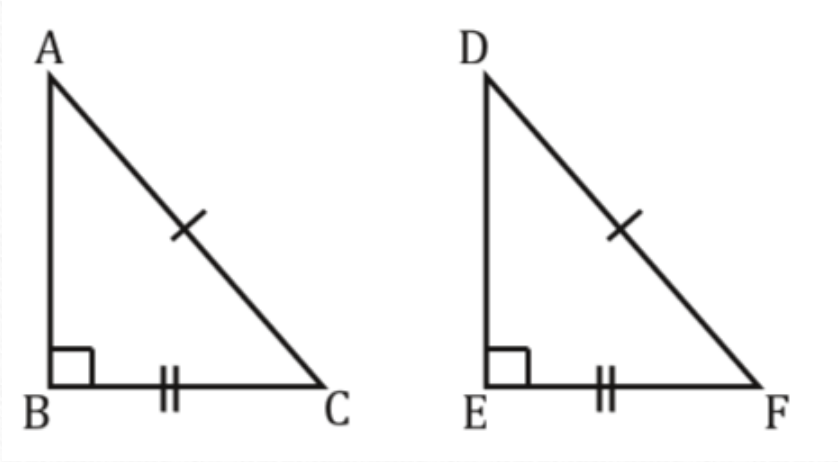


Since $\angle J \cong \angle M$, $\angle I \cong \angle L$ and $\overline{IH} \cong \overline{LK}$ we can say $\Delta HIJ \cong \Delta KLM$ by **AAS**.

THE THEOREMS

HL – Hypotenuse Leg

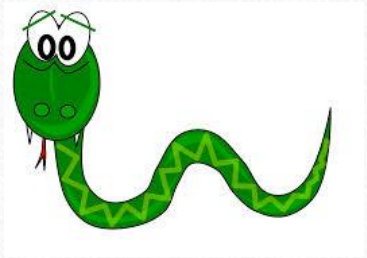
This is a special case for right triangles and is a shortcut for the SSS theorem. Think Pythagorean Theorem. If you know one side and the hypotenuse, you can the third side.



Since $\overline{AC} \cong \overline{DF}$ and $\overline{BC} \cong \overline{EF}$ we can say $\Delta ABC \cong \Delta DEF$ by **HL**.

So you have 5 theorems to remember…

SSS



SAS

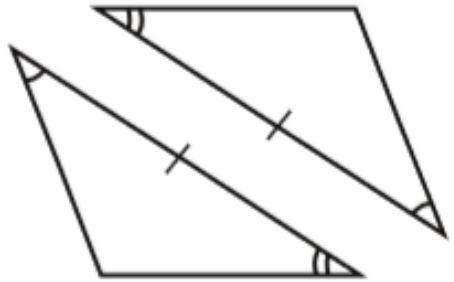
ASA

HL

AAS

Which theorem can we use to prove each pair of triangles are congruent?

5.



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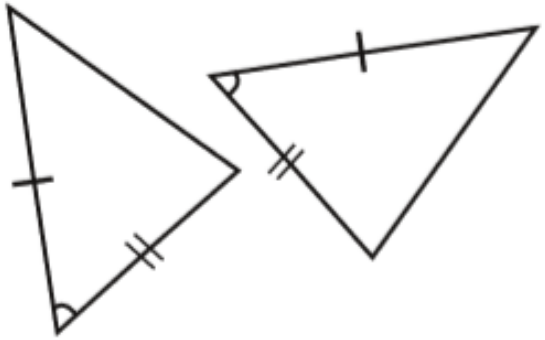

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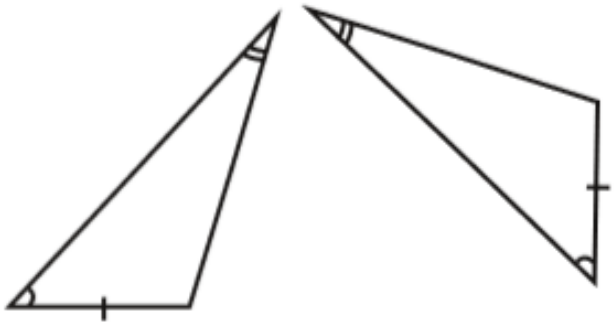

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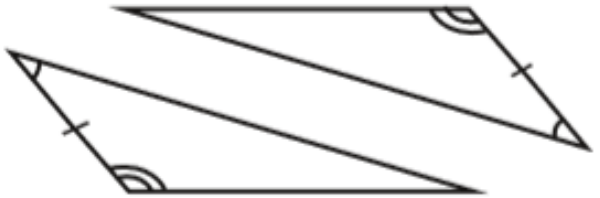

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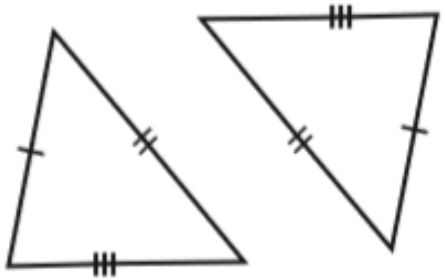

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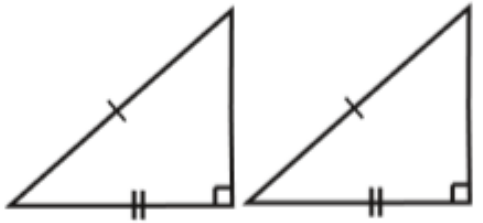
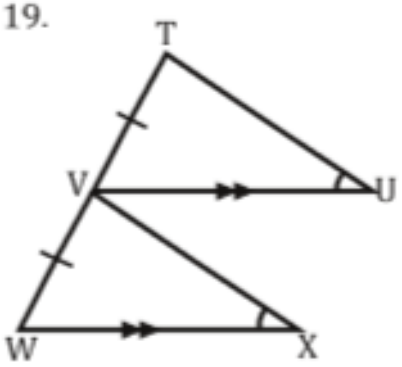


Which theorem can we use to prove each pair of triangles are congruent?

19.



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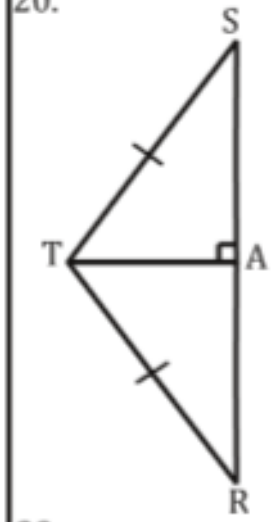

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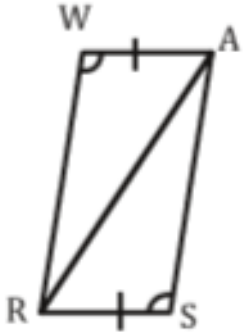
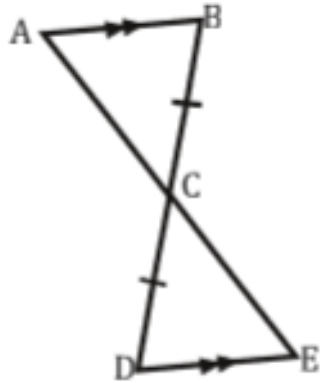
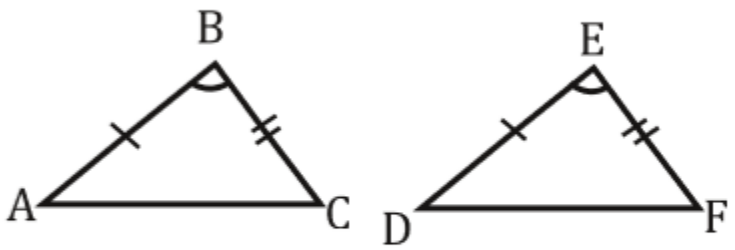


22.



Now let's think in terms of a two column proof.

Given: $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, and $\angle B \cong \angle E$



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

Your Claim	Why you can make your claim
$\overline{AB} \cong \overline{DE}$	**Given**
$\overline{BC} \cong \overline{EF}$,	**Given**
$\angle B \cong \angle E$	**Given**
$\triangle ABC \cong \triangle DEF$	**SAS**

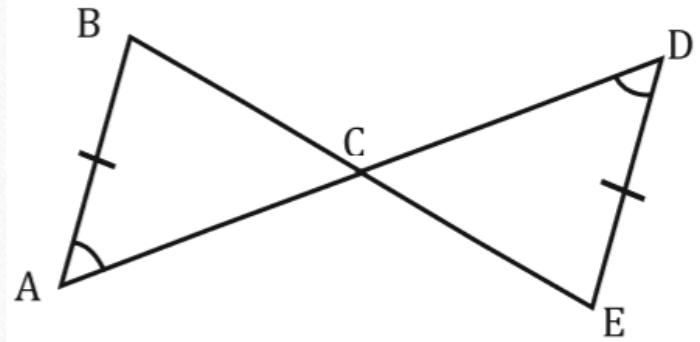
Your first statements should always reflect what you are given.

Your last statement should always be what you're trying to prove.

In this case there was nothing to add to the proof!

Most of the time, you have to look for properties you can use to make your case.

Given: $\overline{AB} \cong \overline{ED}$, $\angle A \cong \angle D$



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

I have an angle and a side, which theorems can I potentially use?

~~SAS~~, ~~ASA~~, AAS

I have no information about another side length.

Can't make any assumptions about angle B.

Your Claim	Why you can make your claim
$\overline{AB} \cong \overline{ED}$	**Given**
$\angle A \cong \angle D$	**Given**
$\angle BCA \cong \angle DCA$	**Vertical Angles are congruent**
$\triangle ABC \cong \triangle DCE$	**AAS**

Perfect practice makes perfect!

Work you your triangles packet. It is due tomorrow.

If you finish it before you leave, you can accumulate credits for a 2 point addition to your unit test grade.

You'll need 5 credits for 2 points.