

Unit 6 Triangle Congruence

Target 6.1: Demonstrate knowledge of triangle facts

6.1a – Classify triangles by sides and angles

6.1b – Construction of equilateral triangles and isosceles triangles

Target 6.2: Apply Properties of Isosceles and Equilateral Triangles

Target 6.3: Identify and Describe Corresponding Parts in Congruent Triangles

Target 6.4: Prove triangles congruent using Third Angles Theorem, SSS, HL, SAS, ASA, & AAS

6.4a – Prove Triangles Congruent by SSS and HL

6.4b – Prove Triangles Congruent by SAS, ASA, AAS

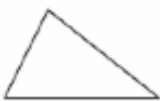
Date	Target	In Class Assignment	Done!
M 11-28	6.1	6.1 Worksheet	
T 11-29	6.2	6.2 Worksheet	
W 11-30	Rev	6.1 – 6.2 Review	
R 12-1	Quiz	Quiz 6.1 – 6.2	
F 12-2	6.3	6.3 Worksheet	
M 12-5	6.4a	6.4a Worksheet	
T 12-6	6.4b	6.4b Worksheet	
W 12-7	Rev	6.3 – 6.4 Review	
R 12-8	Quiz	Quiz 6.3 – 6.4	
F 12-9	Rev	Unit 6 Test Review	
M 12-12	Rev	Unit 6 Test Review	
T 12-13	Test	Unit 6 Test	

NAME: _____

6.1 – Classify Triangles By Sides and Angles (Part 1)

Target 1: Demonstrate knowledge of triangle facts

Classifying Triangles by Sides



___ congruent
sides

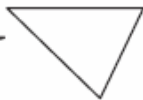


At least ___
congruent sides



___ congruent
sides

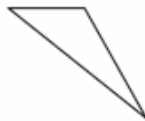
Classifying Triangles by Angles



___ acute
angles



___ right
angle



___ obtuse
angle



___ congruent
angles

Annotate Here

Example 1: Identify the type of triangle given the information

$m\angle B$ is 4 times $m\angle A$, and $m\angle A = 30^\circ$. What type of triangle is $\triangle ABC$? Sketch the triangle

YOU TRY NOW!

1. $m\angle R$ is 60° , $m\angle F$ is 30° , and $m\angle A = 90^\circ$ in a triangle. Which descriptions match this triangle? Choose all that apply.

- a) Right Triangle
- b) Obtuse Triangle
- c) Scalene Triangle
- d) Isosceles Triangle

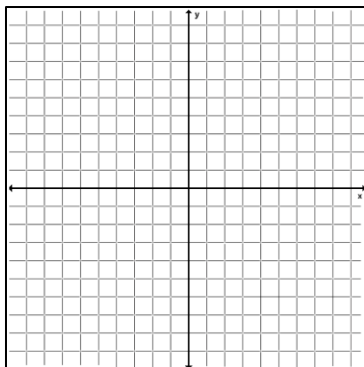
2. Classify the triangle given by the coordinates below by its sides.
(Show all work)

A(2, 3), B(6, 3) and C(2, 7).

AB = _____

BC = _____

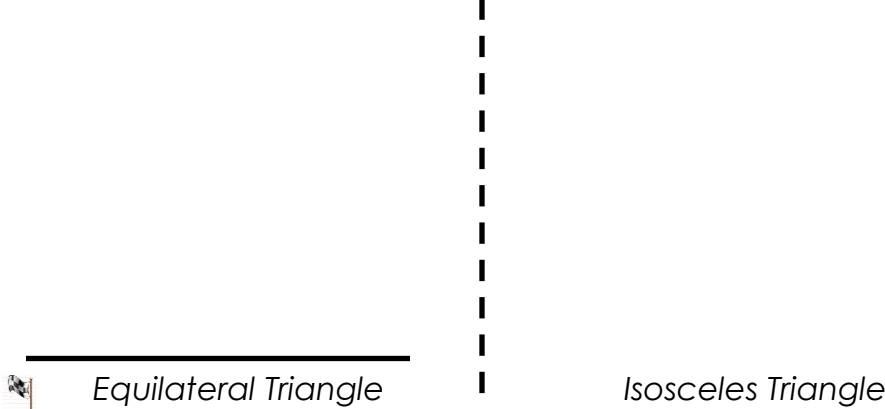
AC = _____



6.1 – Constructions of Equilateral & Isosceles Triangles (PART 2)

Target 1: Demonstrate knowledge of triangle facts

Example 1. Construct an equilateral triangle and isosceles triangle given a base



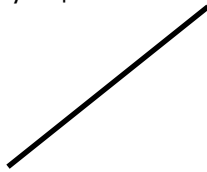
YOU TRY NOW!

1. Construct an equilateral triangle given the following bases.

a) Equilateral



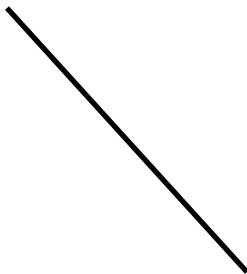
b) Equilateral



c) Isosceles



d) Isosceles



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Equilateral

<https://www.youtube.com/watch?v=t-ZtoNhEYWQ>



Isosceles

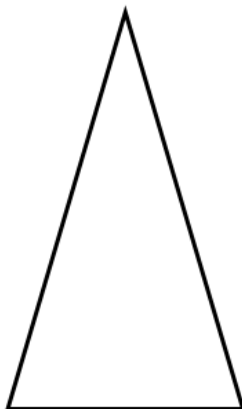
<https://www.youtube.com/watch?v=XEgNWOju37Y>



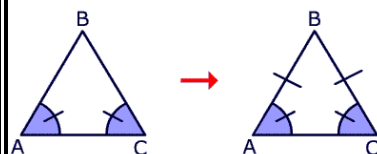
6.2 – Properties of Isosceles Triangles and Equilateral Triangles

Target 2: Apply Properties of Isosceles Triangles and Equilateral Triangles

Drawing with your teacher!



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Base Angles Theorem

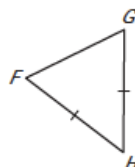
If two sides of a triangle are congruent, then the angles opposite them are congruent.

If $\overline{AB} \cong \overline{AC}$, then $\angle B \cong$ _____.

Converse of the Base Angles Theorem

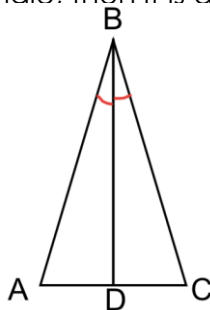
If $\angle B \cong \angle C$, then $\overline{AB} \cong$ _____.

Example 1: In $\triangle FGH$, $\overline{FH} \cong \overline{GH}$. Name two congruent angles.



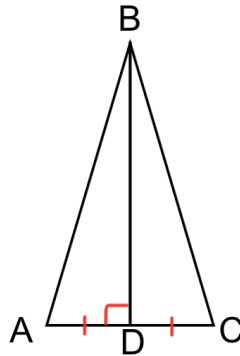
Isosceles Bisector Theorem

If a line bisects an isosceles triangle's vertex angle, then it is a perpendicular bisector of the base.



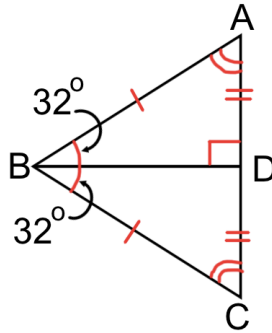
Isosceles Bisector Theorem Converse

If a line is a perpendicular bisector of an isosceles triangle's base, then it is also the angle bisector of the vertex angle.



Example 2: Use properties of the isosceles triangles

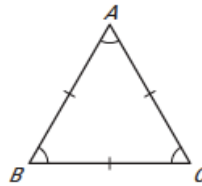
What is $m\angle A$?



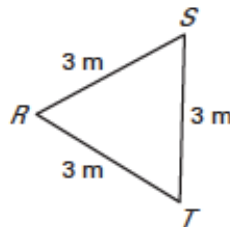
Equilateral Triangles

If a triangle is equilateral, then it is _____.

If a triangle is equiangular, then it is _____.



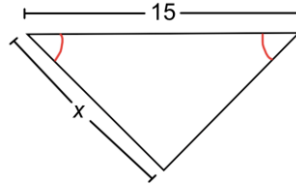
Example 3: Find the measures of $\angle R$, $\angle S$, and $\angle T$.



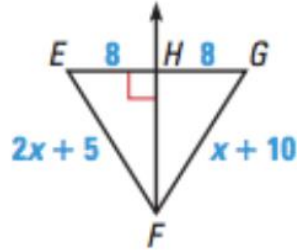
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YOU TRY NOW!

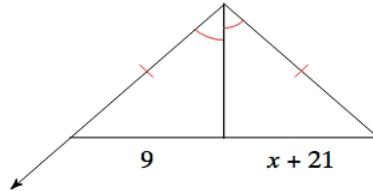
1. If the perimeter of the triangle below is 35, what is the value of x ?



2. What is the length of FG ?



2. What is the value of x ?



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6.3 – Apply Congruence and Triangle

Target 3: Identify and Describe Corresponding Parts in Congruent Triangles

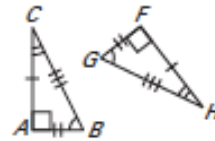
Vocabulary

Congruent Figures: _____

Corresponding Parts: _____

Example 1: Identify Congruent Parts

Write a congruence statement for the triangle. Identify all parts of congruent corresponding parts.



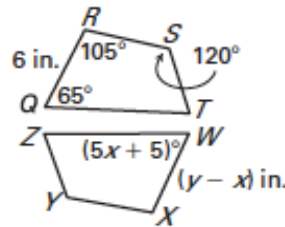
$\triangle ABC \cong \triangle$ _____

Corresponding Angles: $\angle A \cong$ _____, $\angle B \cong$ _____, $\angle C \cong$ _____

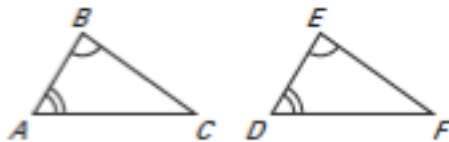
Corresponding Sides: $\overline{AB} \cong$ _____, $\overline{BC} \cong$ _____, $\overline{CA} \cong$ _____

Example 2: Use Properties of Congruent Figures

In the diagram, $QRST \cong WXYZ$. Find x and y.



Third Angles Theorem



If two angles of one triangle are congruent to two other angles of another triangle, then the thirds angles are ALSO _____

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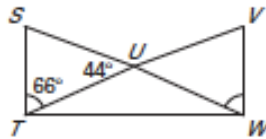
QR SCAN the images below for vocab!



Example 3: Use the Third Angles Theorem (ON YOUR OWN)

Find $m\angle V$.

Step 1: What can you conclude first?

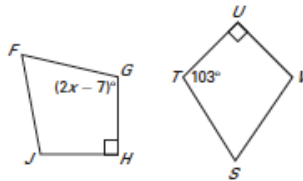


Step 2: What should all of the interior angles of a triangle add up to?

Step 3: Find $m\angle V$

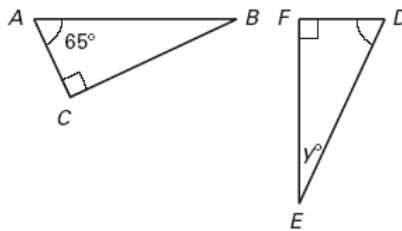
YOU TRY NOW!

1. $HGFJ \cong UTSV$. Identify all pairs of congruent corresponding parts. Write each pair in a congruent statement.

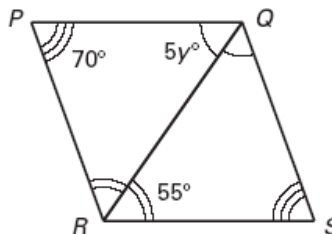


2. Find the value of x and find $m\angle G$.

3. Find y .



4. Find $m\angle S$.



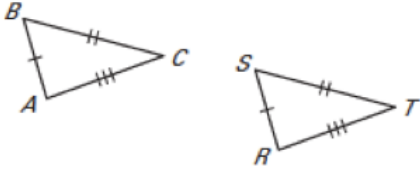
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6.4a– Prove Triangles Congruent by SSS and HL

Target 4: Prove triangles congruent using Third Angles Theorem, SSS, HL, SAS, ASA, & AAS

Side-Side-Side Congruence (SSS)

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



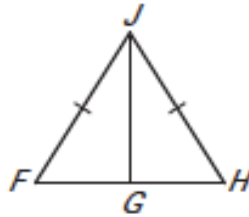
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Example 1: Use the SSS Congruence Postulate

Write a proof.

Given $\overline{FJ} \cong \overline{HJ}$,
 G is the midpoint of \overline{FH} .

Prove $\triangle FGJ \cong \triangle HGJ$

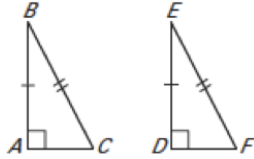


Statements

Reason

Statements	Reason
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

Hypotenuse-Leg Congruence (HL)

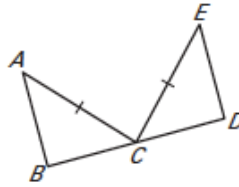


If the hypotenuse and a leg of a right triangle are congruent to the hypotenuse and a leg of a second triangle, then the two triangles are _____.

Example 2: Use the Hypotenuse-Leg Theorem

Given $\overline{AC} \cong \overline{EC}$,
 $\overline{AB} \perp \overline{BD}$,
 $\overline{ED} \perp \overline{BD}$,
 \overline{AC} is a bisector of \overline{BD} .

Prove $\triangle ABC \cong \triangle EDC$



Statements	Reason
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.
6.	6.

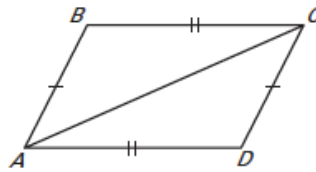
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YOU TRY NOW!

1. Write a proof.

GIVEN: $\overline{AB} \cong \overline{CD}$, $\overline{BC} \cong \overline{AD}$

PROVE: $\triangle ABC \cong \triangle CDA$

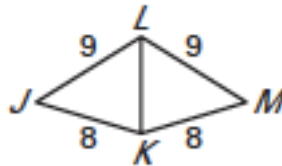


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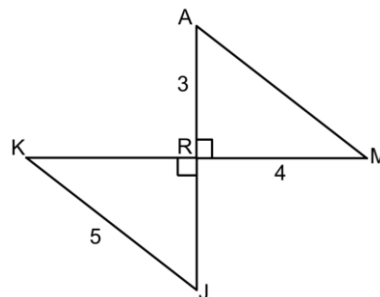
Statements	Reason
1.	1.
2.	2.
3.	3.
4.	4.
5.	5.

2. Decide whether the triangle congruence statement is true.

$\triangle JKL \cong \triangle MKL$



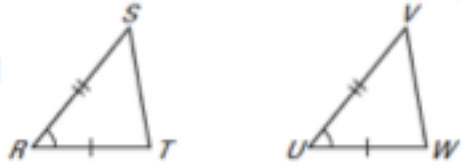
3. Show that you cannot prove $\triangle KJR \cong \triangle MAR$ are congruent based on the information in the diagram



6.4c – Prove Triangles Congruent by SAS, ASA, AAS

Target 4: Prove triangles congruent using Third Angles Theorem, SSS, HL, SAS, ASA, & AAS

Side-Angle-Side Congruence (SAS)

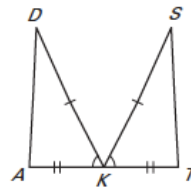


If two sides and the INCLUDED angle of one triangle are congruent to two sides and the INCLUDED angle of a second triangle, then the two triangles are congruent.

Example 1: Use the SAS Congruence Postulate

Is there enough information to prove that the triangle is congruent using SAS?

$\triangle DKA, \triangle TKS$

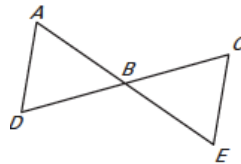


Example 2: Write a Proof Using SAS Congruence

Write a proof.

GIVEN: B is the midpoint of \overline{AE} .
 B is the midpoint of \overline{CD} .

PROVE: $\triangle ABD \cong \triangle EBC$



Annotate Here

Statements

Reason

1.

1.

2.

2.

3.

3.

4.

4.

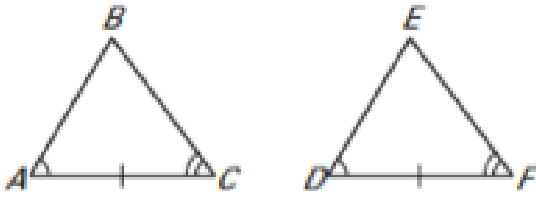
5.

5.

6.

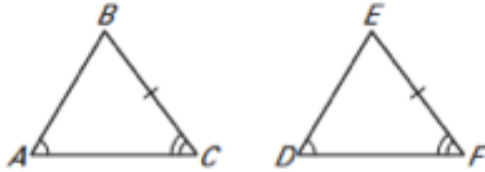
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Angle-Side-Angle Congurunce (ASA)



If two angles and the INCLUDED side of one triangle are congruent to two angles and the INCLUDED side of a second triangle, then the two triangles are congruent.

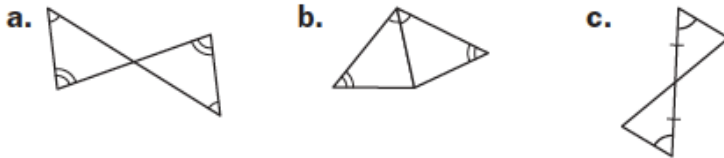
Angle-Angle Side Congurunce (AAS)



If two angles and the non-INCLUDED side of on triangle are congruent to two angles and the corresponding non-INCLUDED side of a second triangle, then the two triangles are congruent.

Example 3: Identify congruent triangles

Can the triangles be proven congruent with the information given in the diagram? If so, state which postulate/theorem (SSS, SAS, ASA, AAS, HL) you woud use?

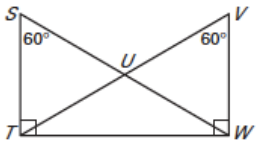


- a. Is there enough information? _____
Postulate/Theorem: _____
- b. Is there enough information? _____
Postulate/Theorem: _____
- c. Is there enough information? _____
Postulate/Theorem: _____

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YOU TRY NOW!

1. Can the triangles be proven congruent with the information given in the diagram? If so, state which postulate/theorem (SSS, SAS, ASA, AAS, HL) you would use?



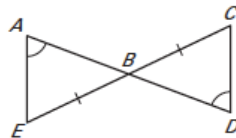
Is there enough information? _____

Postulate/Theorem: _____

2. Complete the proof.

GIVEN: $\overline{BE} \cong \overline{BC}$, $\angle A \cong \angle D$

PROVE: $\triangle ABE \cong \triangle DBC$

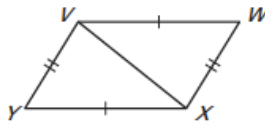


Statements	Reason
1.	1.
2.	2.
3.	3.
4.	4.

3. Complete the proof.

GIVEN: $\overline{VW} \cong \overline{XY}$, $\overline{WX} \cong \overline{YV}$

PROVE: $\triangle WXV \cong \triangle YVX$



Statements	Reason
1.	1.
2.	2.
3.	3.
4.	4.

Annotate Here