CONGRUENT TRIANGLES

Chapter 4

GEOMETRY 2019-20

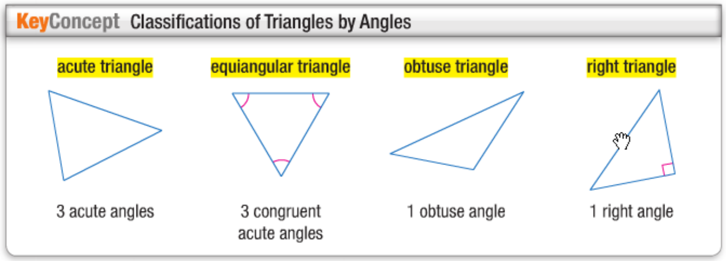
Name ______________________________________Hour ______

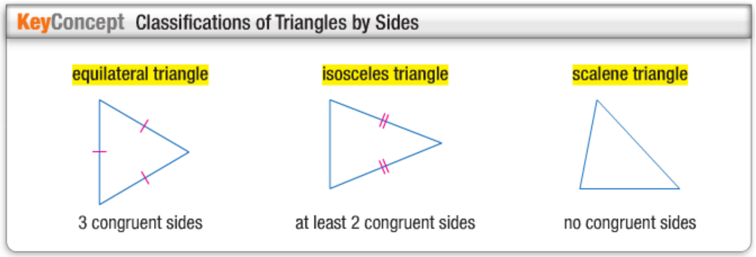
Geometry **Classifying Triangles** 4.1

Objectives:

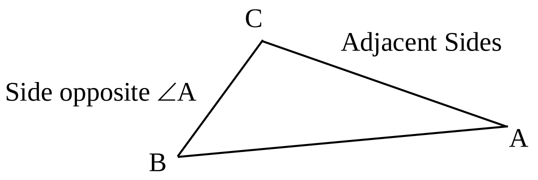
1) classify triangles by their angle measures and side lengths
2) use triangle classification to find angle measures and side lengths

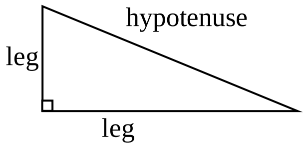
Triangles can be classified by their ________________ and/or their _________________.





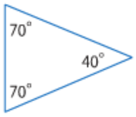
Triangle ABC use the symbol ΔABC

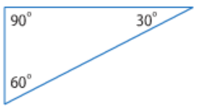


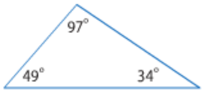


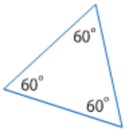
Each point is a _________________________.

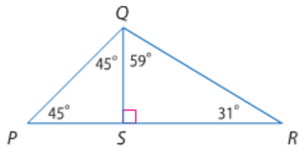
Example 4-1-1: Classify each triangle by its angles: *acute*, *equiangular*, *obtuse*, or *right*.











____________ ____________ ____________ ____________ ____________

Example 4-1-2: Classify the Triangle by angle measures

a. Δ BDC

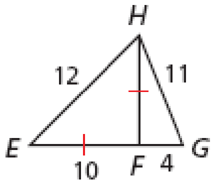
b. Δ ABD

Example 4-1-3: Classify the Triangle by side lengths

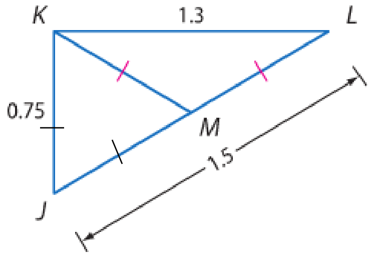
a. Δ EHF

b. Δ EHG

c. Δ HFG



Example 4-1-4: If point M is the midpoint of $\overline{JL}$, classify ΔMLK, ΔJKM, and ΔKJL by their sides: *equilateral, isosceles,* or *scalene*.

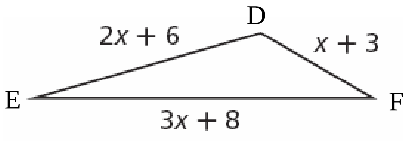


$\Delta\ MLK$: ________________________

Δ JKM: ________________________

Δ KJL: _________________________

Example 4-1-5: If the perimeter is 47, find *x* and the length of each side. $x =$__



$DE =$_____

$DF =$_____

$EF =$_____

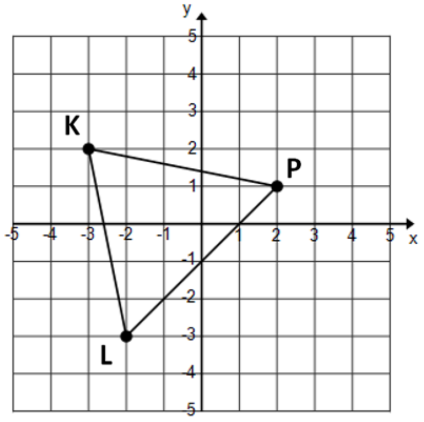
Why do you round the answer down instead of rounding the answer up?

Example 4-1-6: Coordinate Plane

Find the measures of the sides of △*KPL* and classify each triangle by its sides.

K(-3, -2) P(1, 3) L(3, -3)

△*KPL* *is a* ______________

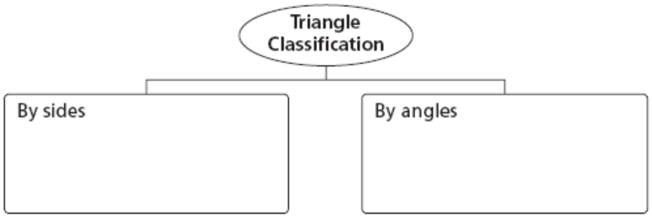


KP =

PL =

KL =

Think and Discuss



Geometry

Angle Relationships in Triangles

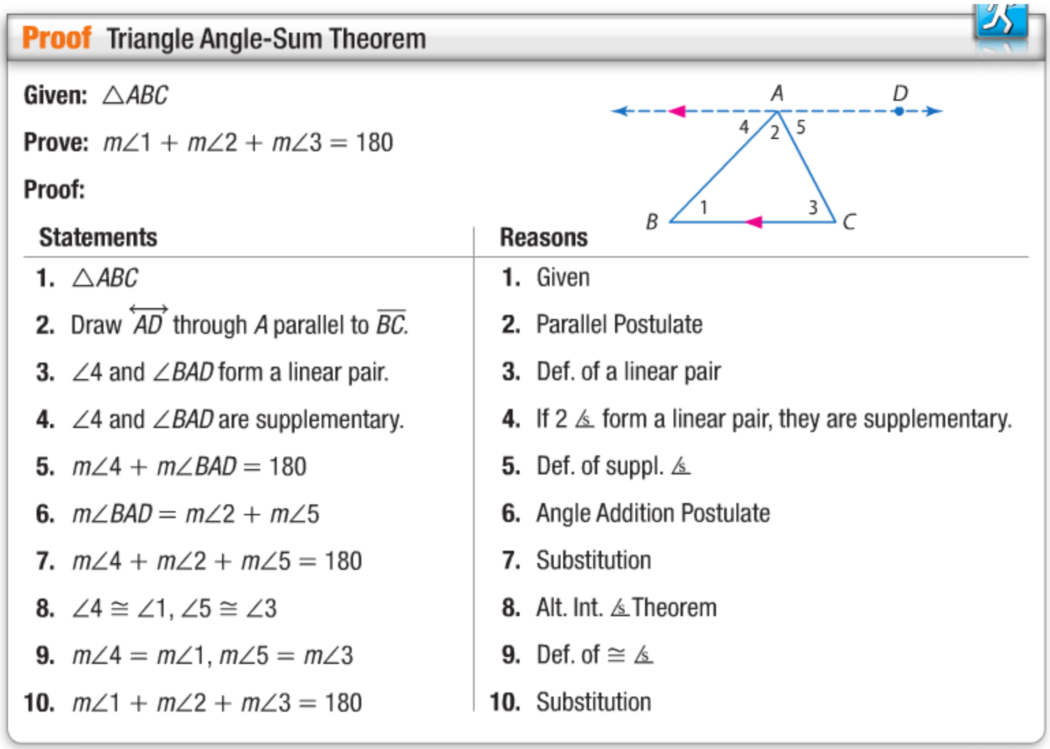
4.2

Objectives:

1) find the measures of interior and exterior angles of triangle
2) apply theorems about the interior and exterior angles of triangles

Auxiliary line →A line added to a diagram to help analyze the diagram. (Below: $\overleftrightarrow{AD}$was added to make a line parallel to the $\overline{BC}$ by the Parallel Postulate.)

Whenever you draw an ***auxiliary line***, you must be able to justify its existence. Give this as the reason: Through any two points there is exactly one line.



Proof **Triangle Angle-Sum Theorem**

Given: $\triangle ABC$

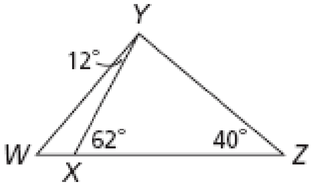
Prove: $m\angle 1 + m\angle 2 + m\angle 3 = 180$

Proof:

Statements	Reasons
1. $\triangle ABC$	**1.** Given
2. Draw $\overleftrightarrow{AD}$ through A parallel to $\overline{BC}$.	**2.** Parallel Postulate
3. $\angle 4$ and $\angle BAD$ form a linear pair.	**3.** Def. of a linear pair
4. $\angle 4$ and $\angle BAD$ are supplementary.	**4.** If 2 ∠s form a linear pair, they are supplementary.
5. $m\angle 4 + m\angle BAD = 180$	**5.** Def. of suppl. ∠s
6. $m\angle BAD = m\angle 2 + m\angle 5$	**6.** Angle Addition Postulate
7. $m\angle 4 + m\angle 2 + m\angle 5 = 180$	**7.** Substitution
8. $\angle 4 \cong \angle 1$, $\angle 5 \cong \angle 3$	**8.** Alt. Int. ∠s Theorem
9. $m\angle 4 = m\angle 1$, $m\angle 5 = m\angle 3$	**9.** Def. of ≅ ∠s
10. $m\angle 1 + m\angle 2 + m\angle 3 = 180$	**10.** Substitution

Example 4-2-1: Real World Application

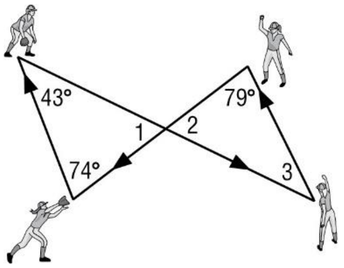
After an accident, the positions of cars are measured by law enforcement to investigate the collision. Use the diagram drawn from the information collected to find the indicated angle measures.



a. m∠ XYZ

b. $m\angle YWZ$

Example 4-2-2: Real World Application The diagram shows the path of the softball in a drill developed by four players. Find the measure of each numbered angle.



$m\angle 1 =$

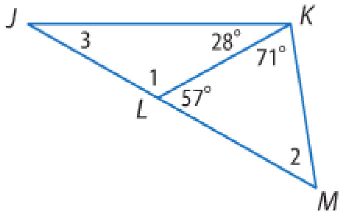
$m\angle 2 =$

$m\angle 3 =$

GuidedPractice

Find the measures of each numbered angle.

1A.

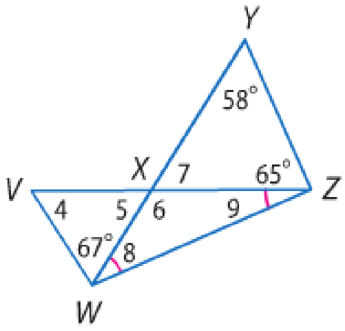


$m\angle 1 =$ ________

$m\angle 2 =$ ________

$m\angle 3 =$ ________

1B.

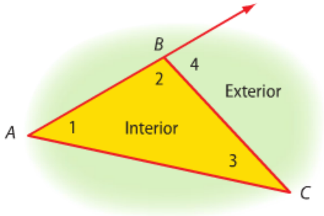


$m\angle 4 =$	$m\angle 7 =$
$m\angle 5 =$	$m\angle 8 =$
$m\angle 6 =$	$m\angle 9 =$

Example 4-2-3: One of the acute angles in a right triangle measures $2x$°. What is the measure of the other acute angle?

Exterior Angle → the ___________ formed by one side and a __________ of the other side

In the picture, it is angle ______



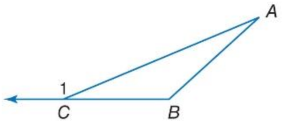
Remote Interior → the interior angles that are not _____________ to that exterior angle

In the picture, the angles are __________

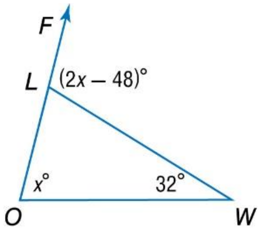
Theorem 4.2 **Exterior Angle Theorem**

The measure of an exterior angle of a triangle is equal to the sum of the measures of the two remote interior angles.

Example $m\angle A + m\angle B = m\angle 1$

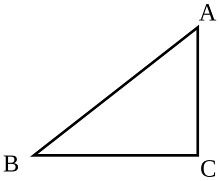


Example 4-2-4: Find the $m\angle FLW$ in the fenced flower garden shown.



$m\angle FLW =$ _________

Corollary → A theorem that can be proven directly from another theorem.



Corollary 4.1 – the acute angles in a right triangle are __________________

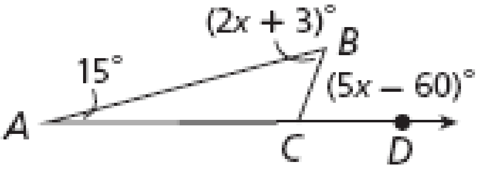
Corollary 4.2 – there can be at most one right or obtuse angle in a triangle.

Corollary – the angles in an Equiangular Triangle are _______________.

Complete the 2-column proof of Corollary 4.1:
Given: Right triangle ABC
Prove: $\angle A$ *and* $\angle B$ are complementary

Statements	Reasons
1. Right triangle ABC	1.
2. $m\angle A + m\angle B + m\angle C = 180$	2.
3. $m\angle C = 90$	3. Def. of right triangle
4. $m\angle A + m\angle B + 90 = 180$	4.
5.	5. Subtraction
6. $\angle A$ *and* $\angle B$ are complementary	6.

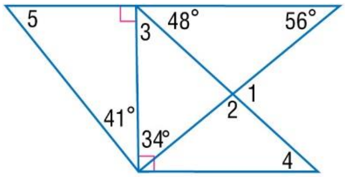
<u>Example 4-2-5</u>: Find the m∠B.



$x =$ ________

$m\angle B =$ ________

<u>Example 4-2-6</u>: Find Angle Measures in Right Triangles



$m\angle 1 =$	$m\angle 2 =$	$m\angle 3 =$
$m\angle 4 =$	$m\angle 5 =$	

Think and Discuss

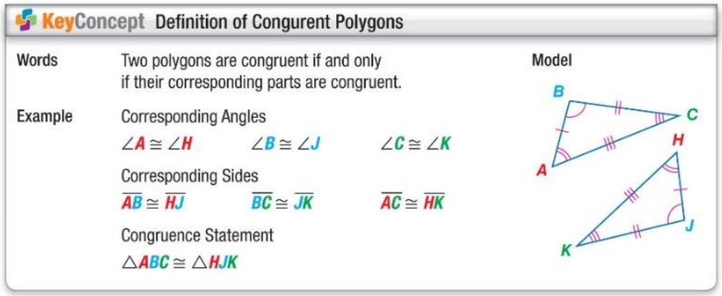
THEOREM	WORDS	DIAGRAM
Triangle Sum Theorem		
Exterior Angles Theorem		
Third Angles Theorem		

Geometry **Congruent Triangles** 4.3

Objectives:

1. use properties of congruent triangles
2. prove triangles congruent by using the definition of congruence

Two figures are ______________________ when they have corresponding angles and corresponding sides that are congruent.



KeyConcept Definition of Congruent Polygons

Words Two polygons are congruent if and only if their corresponding parts are congruent.

Example Corresponding Angles

$\angle A \cong \angle H$ $\angle B \cong \angle J$ $\angle C \cong \angle K$

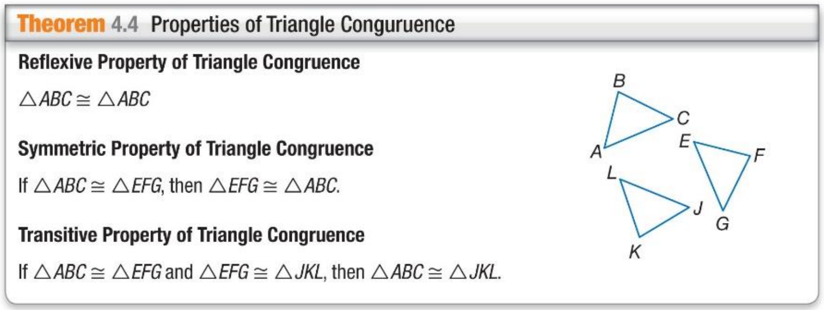
Corresponding Sides

$\overline{AB} \cong \overline{HJ}$ $\overline{BC} \cong \overline{JK}$ $\overline{AC} \cong \overline{HK}$

Congruence Statement

$\triangle ABC \cong \triangle HJK$

Model



Theorem 4.4 Properties of Triangle Congruence

Reflexive Property of Triangle Congruence

$\triangle ABC \cong \triangle ABC$

Symmetric Property of Triangle Congruence

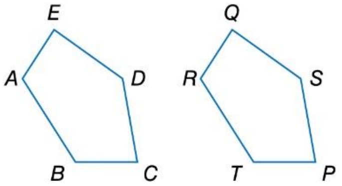
If $\triangle ABC \cong \triangle EFG$, then $\triangle EFG \cong \triangle ABC$.

Transitive Property of Triangle Congruence

If $\triangle ABC \cong \triangle EFG$ and $\triangle EFG \cong \triangle JKL$, then $\triangle ABC \cong \triangle JKL$.

Example 4-3-1: Identify Corresponding Congruent Parts

Show that the polygons are congruent by identifying all of the congruent corresponding parts. Then write a congruence statement.



Sides	Angles
Congruence statement:	

Triangle Congruence (CPCTC)

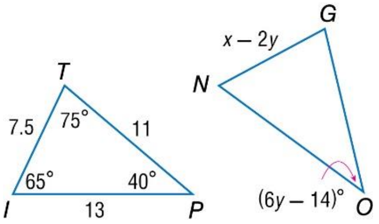
Knowing that all pairs of corresponding parts of congruent triangles are congruent (CPCTC) can help you reach conclusions about congruent figures.

CPCTC → Corresponding Parts of Congruent Triangles are Congruent

CPCTC → Corresponding Parts of Congruent Triangles are Congruent

Example 4-3-2: Use Corresponding Parts of Congruent Triangles

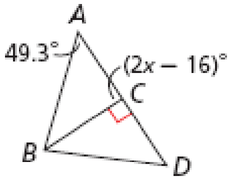
In the diagram, $\Delta ITP \cong \Delta NGO$. Find the values of x and y.



Example 4-3-3: Given: ∆ABC ≅ ∆DBC

a. Find the value of x

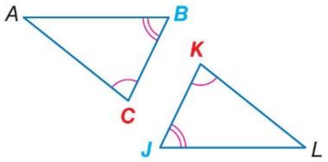
b. Find the $m\angle DBC$



Theorem 4.3 Third Angles Theorem

Words: If two angles of one triangle are congruent to two angles of a second triangle, then the third angles of the triangles are congruent.

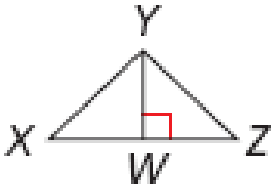
Example: If ∠*C* ≅ ∠*K* and ∠*B* ≅ ∠*J*, then ∠*A* ≅ ∠*L*.



Example 4-3-4: Proving triangles congruent.

Given: ∠YWX and ∠YWZ are right angles. $\overline{YW}$ bisects ∠XYZ. W is the midpoint of $\overline{XZ}$. $\overline{XY} \cong \overline{YZ}$

Prove: $\Delta XYW \cong \Delta ZYW$

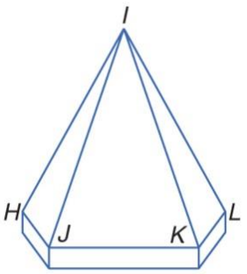


Statements	Reasons
1. ∠YWX and ∠YWZ are right angles	Given
2. W is the midpoint of $\overline{XZ}$.	Given
3.	Def. of midpoint
4. $\overline{YW}$ bisects ∠XYZ	Given
5.	Def. of ∠ bisector
6.	All right ∠'s ≅
7. $\overline{XY} \cong \overline{YZ}$	Given
8.	Reflexive
9.	Third ∠'s Thm
10. $\Delta XYW \cong \Delta ZYW$	

Definition of congruent figures:

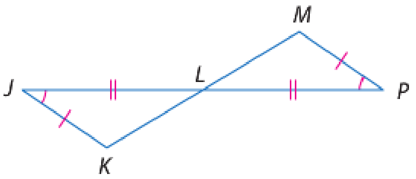
In order to prove the triangles congruent we need to show all the corresponding sides and angles are congruent.

Example 4-3-5: **Use the Third Angles Theorem**
A drawing of a tower's roof is composed of congruent triangles all converging at a point at the top. If $\angle IJK \cong \angle IKJ$ and $m\angle IJK = 72$, find $m\angle JIH$.



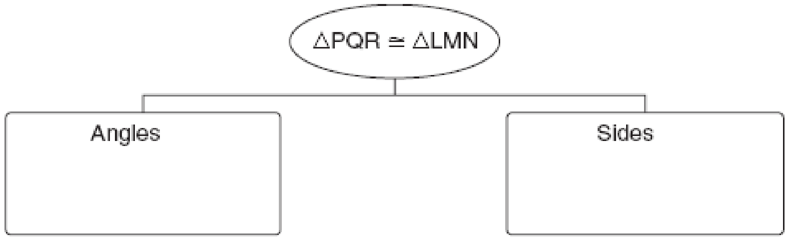
Example 4-3-6: Prove Triangles Congruent

Given: $\overline{JL} \cong \overline{PL}$, and L bisects $\overline{KM}$.
$\angle J \cong \angle P, \overline{JK} \cong \overline{PM}$
Prove: $\Delta JLK \cong \Delta PLM$



Statements	Reasons
1 $\overline{JL} \cong \overline{PL}, \angle J \cong \angle P, \overline{JK} \cong \overline{PM}$	1. Given
2 L bisects $\overline{KM}$	2. Given
3 $\overline{KL} \cong LM$	3.
4	4. Vertical Angles Thm
5 $\angle K \cong \angle M$	5.
6 $\Delta JLK \cong \Delta PLM$	6.

Think and Discuss – complete the graphic organizer

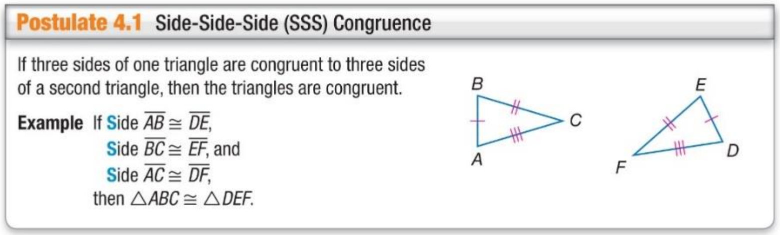


Geometry Proving Triangles are Congruent: SSS and SAS 4.4

Objectives:

1. apply SSS and SAS to construct triangles and to solve problems
2. prove triangles congruent by using SSS and SAS to construct triangles and to solve problems.

Triangle Rigidity –

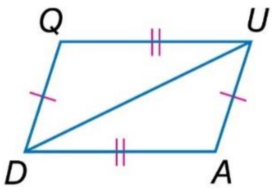


Postulate 4.1 Side-Side-Side (SSS) Congruence

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

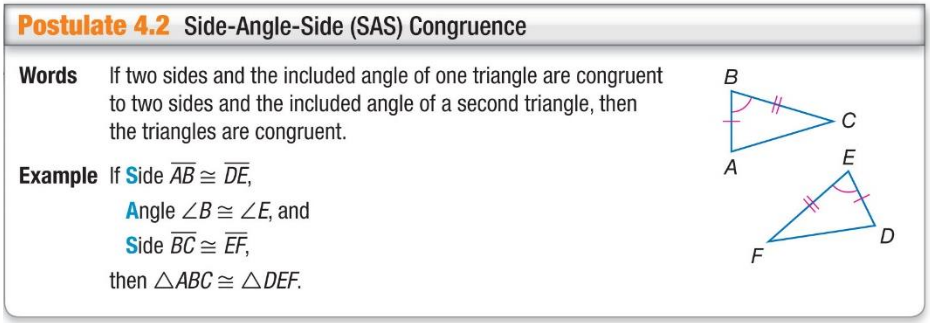
Example If **S**ide $\overline{AB} \cong \overline{DE}$,
Side $\overline{BC} \cong \overline{EF}$, and
Side $\overline{AC} \cong \overline{DF}$,
then $\triangle ABC \cong \triangle DEF$.

Example 4-4-1: **Use SSS to Prove Triangles Congruent**



Given: $\overline{QU} \cong \overline{AD}, \overline{QD} \cong \overline{AU}$
Prove: $\Delta\, QUD \cong \Delta\, ADU$

Statements	Reasons
1. $\overline{QU} \cong \overline{AD},\ \overline{QD} \cong \overline{AU}$	1. Given
2.	2.
3. $\Delta\, QUD \cong \Delta\, ADU$	3.



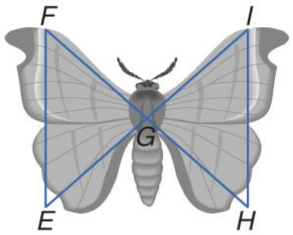
Postulate 4.2 Side-Angle-Side (SAS) Congruence

Words 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 triangles are congruent.

Example If **S**ide $\overline{AB} \cong \overline{DE}$,
Angle $\angle B \cong \angle E$, and
Side $\overline{BC} \cong \overline{EF}$,
then $\triangle ABC \cong \triangle DEF$.

Included Angle →

Example 4-4-2: **Use SAS to Prove Triangles are Congruent**

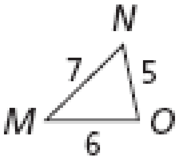


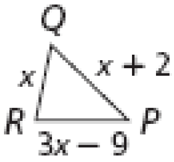
The wings of one type of moth form two triangles. Write a two-column proof to prove that $\Delta FEG \simeq \Delta HIG$, if $\overline{EI} \simeq \overline{FH}$, and G is the midpoint of both $\overline{EI}$ and $\overline{FH}$.

Statements	Reasons
1. $\overline{EI} \simeq \overline{FH}$	1. Given
2. G is the midpoint of both $\overline{EI}$ and $\overline{FH}$	2. Given
3. $\overline{EG} \simeq \overline{GI},\ \overline{FG} \simeq \overline{GH}$	3.
4. $\angle FGE \cong \angle IGH$	4.
5. $\Delta FEG \simeq \Delta HIG$	5.

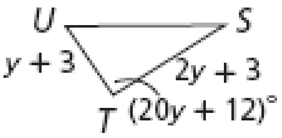
Example 4-4-4: Show that the triangles are congruent for the given value of the variable.

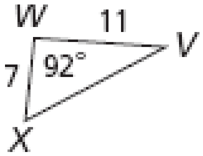
a. $\Delta MNO \cong \Delta PQR$, when $x = 5$





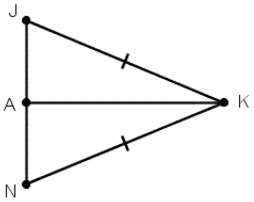
b. $\Delta STU \cong \Delta VWX$, when $y = 4$





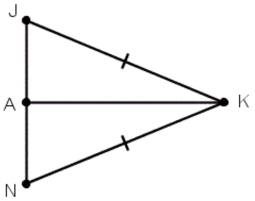
Example 4-4-5: Determine if SSS or SAS or neither is used in the following triangle congruency. Mark your diagram!

Ex A:
Given: A is the midpoint of $\overline{JN}$



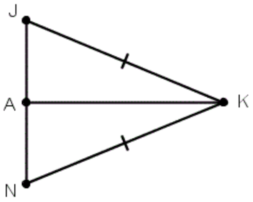
SSS SAS Neither

Ex B:
Given: $\overline{KA}$ bisects $\angle JKN$



SSS SAS Neither

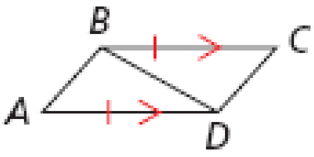
Ex C:
Given: $\angle J \cong \angle N$



SSS SAS Neither

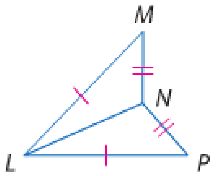
Example 4-4-6:

Given: $\overline{BC} || \overline{AD}, \overline{BC} \cong \overline{AD}$
Prove: $\Delta\, ABD \cong \Delta\, CDB$



Statements	Reasons
1. $\overline{BC} \| \overline{AD}$	1. Given
2. $\overline{BC} \cong \overline{AD}$	2. Given
3.	3.
4.	4.
5. $\Delta\, ABD \cong \Delta\, CDB$	5.

Example 4-4-7:

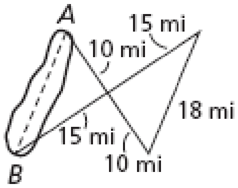


Given: $\overline{MN} \cong \overline{PN}, \overline{LM} \cong \overline{LP}$
Prove: $\angle LNM \cong \angle LNP$

Statements	Reasons
1. $\overline{MN} \cong \overline{PN}, \overline{LM} \cong \overline{LP}$	1. Given
2.	2.
3. $\Delta LNM \cong \Delta LNP$	3.
4. $\angle LNM \cong \angle LNP$	4. CPCTC

Example 4-4-8: Real World Application

A and *B* are on the edges of a ravine. What is *AB*?

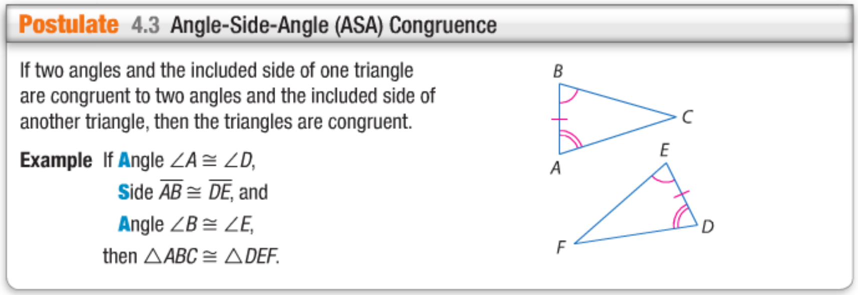


Geometry Proving Triangles are Congruent: ASA and AAS 4.5

Objectives:

1. apply ASA, AAS, and HL to construct triangles and to solve problems
2. prove triangles congruent by using ASA, AAS, and HL to construct triangles and to solve problems.

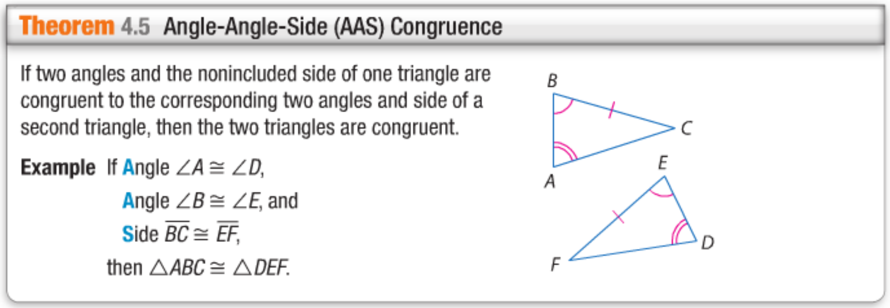
Included side →



Postulate 4.3 Angle-Side-Angle (ASA) Congruence

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

Example If **A**ngle $\angle A \cong \angle D$,
Side $\overline{AB} \cong \overline{DE}$, and
Angle $\angle B \cong \angle E$,
then $\triangle ABC \cong \triangle DEF$.



Theorem 4.5 Angle-Angle-Side (AAS) Congruence

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

Example If **A**ngle $\angle A \cong \angle D$,
Angle $\angle B \cong \angle E$, and
Side $\overline{BC} \cong \overline{EF}$,
then $\triangle ABC \cong \triangle DEF$.

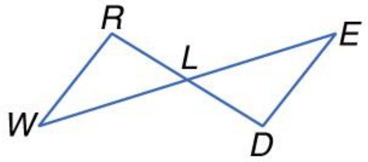
NOTE: **Two methods that CANNOT be used are: AAA and SSA**

Think about
Example 4-5-1

We used ASA, can it be done with AAS?
If not, why not.

If so, what additional information would you need?

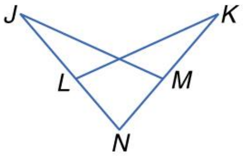
Example 4-5-1 – **Use ASA to Prove Triangles Congruent**



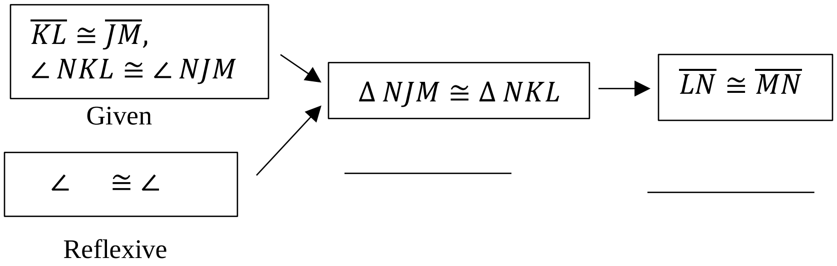
Given: $\overline{WR} || \overline{ED}, L$ is the midpoint of $\overline{WE}$
Prove: $\Delta\, WRL \cong \Delta\, EDL$

Statements	Reasons
1. $\overline{WR} \| \overline{ED}, L$ is the midpoint of $\overline{WE}$	1. Given
2.	2. def of midpoint
3.	3.
4. $\angle \quad \cong \angle$	4.
5. $\Delta\, WRL \cong \Delta\, EDL$	5.

Example 4-5-2 – **Use AAS to Prove Triangles Congruent**



Given: $\overline{KL} \cong \overline{JM}, \angle\, NKL \cong \angle\, NJM$
Prove: $\overline{LN} \cong \overline{MN}$



$\overline{KL} \cong \overline{JM}$,
$\angle\, NKL \cong \angle\, NJM$

Given

$\angle \quad \cong \angle$

Reflexive

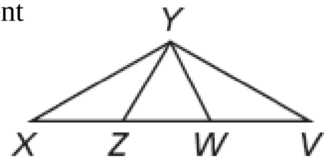
$\Delta\, NJM \cong \Delta\, NKL$

____

$\overline{LN} \cong \overline{MN}$

____

Example 4-5-3: Use AAS to prove the triangles congruent

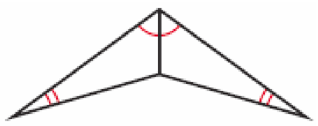


Given: $\angle X \cong \angle V$, $\angle YZW \cong \angle YWZ$, $\overline{XY} \cong \overline{VY}$
Prove: $\Delta XYZ \cong \Delta VYW$

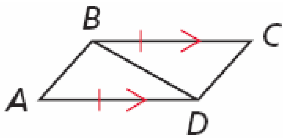
Statements	Reasons
1. $\angle X \cong \angle V$, $\angle YZW \cong \angle YWZ$, $\overline{XY} \cong \overline{VY}$	1. Given
2. $\Delta\, XYW \cong \Delta\, VYZ$	2.
3. $\overline{YZ} \cong \overline{YW}$	3.
4. $\angle \quad \cong \angle$	4. Congruent Supplements Thm.
5. $\Delta XYZ \cong \Delta VYW$	5.

Example 4-5-4: Which method would you use? Support your reasoning with correct markings on the diagram.

A.



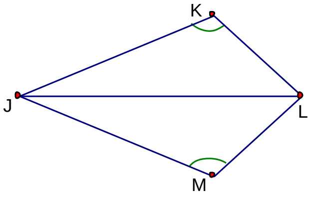
B.



____

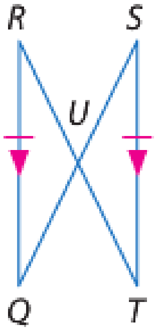
____

C.



Given: $\overline{JL}$ bisects $\angle KLM$. $\angle K \cong \angle M$.

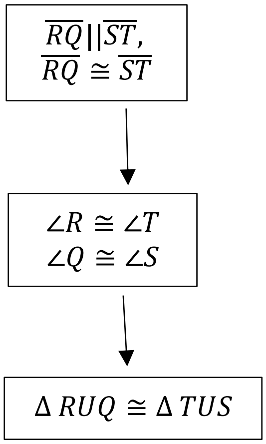
Example 4-5-5: Flow Proof



Given: $\overline{RQ} || \overline{ST}, \overline{RQ} \cong \overline{ST}$
Prove: $\Delta RUQ \cong \Delta TUS$

Plan: 1st possible approach: Use parallel line theorem twice to use ASA.
2nd possible approach: Use a parallel line theorem and vertical angles to use AAS.

Plan 1

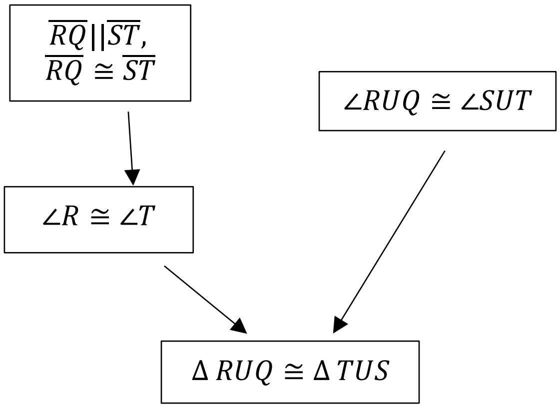


$\overline{RQ} || \overline{ST}$, $\overline{RQ} \cong \overline{ST}$

$\angle R \cong \angle T$
$\angle Q \cong \angle S$

$\Delta RUQ \cong \Delta TUS$

Plan 2



$\overline{RQ} || \overline{ST}$, $\overline{RQ} \cong \overline{ST}$

$\angle RUQ \cong \angle SUT$

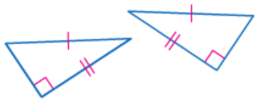
$\angle R \cong \angle T$

$\Delta RUQ \cong \Delta TUS$

4.5 – Extension: Right Triangle Congruence: HL

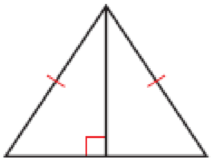
Theorem 4.9 Hypotenuse-Leg Congruence
If the hypotenuse and a leg of one right triangle are congruent to the hypotenuse and corresponding leg of another right triangle, then the triangles are congruent.

Abbreviation *HL*

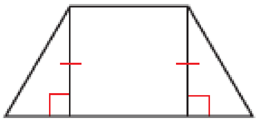


Example 4-5-6: Determine if you can use the HL Congruence Theorem to prove the triangles congruent. If not, tell what else you need to know.

A.



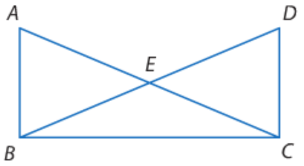
B.



Yes No: ______________ Yes No: _________________

Example 4-5-7:

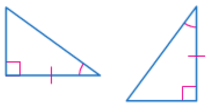
Given: $\overline{AB} \perp \overline{BC}, \overline{DC} \perp \overline{BC}, \overline{AC} \cong \overline{BD}$
Prove: $\overline{\mathrm{AB}} \cong \overline{DC}$



Statements	Reasons
1. $\overline{AB} \perp \overline{BC}, \overline{DC} \perp \overline{BC}$	1. Given
2. $\overline{BC} \cong \overline{BC}$	2.
3.	3. Def. of $\perp$
4.	4. All right $\angle's \cong$
5. $\overline{AC} \cong \overline{BD}$	5. Given
6. $\Delta\, ABC \cong \Delta\, DCB$	6.
7. $\overline{\mathrm{AB}} \cong \overline{DC}$	7.

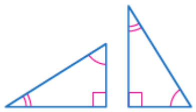
Example 4-5-8: Determine whether each pair of triangles is congruent. If yes, tell which postulate or theorem applies.

A.



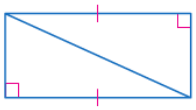
Yes: ________ No

B.



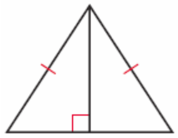
Yes: ________ No

C.



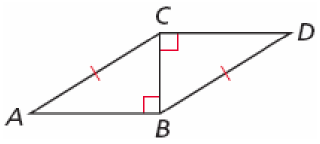
Yes: ________ No

D.



Yes: ________ No

E.



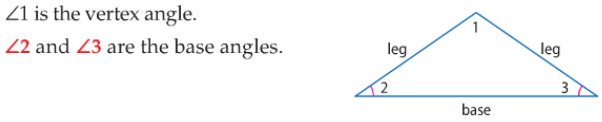
Yes: ________ No

Geometry Isosceles and Equilateral Triangles 4.6

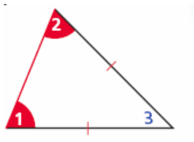
Objectives:

1. prove theorems about isosceles and equilateral triangles
2. apply properties of isosceles and equilateral triangles

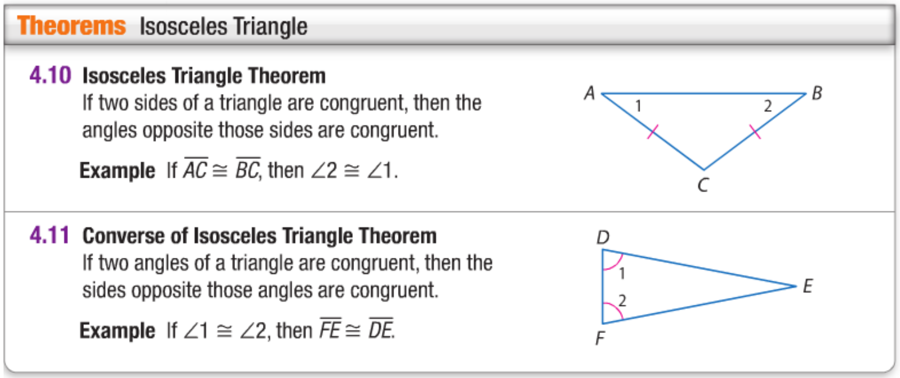
Isosceles triangle → An **isosceles triangle** has two congruent sides called the **legs**. The angle formed by the legs is called the **vertex angle**. The other two angles are called **base angles**. You can prove a theorem and its converse about isosceles triangles.


∠1 is the vertex angle.

∠2 and ∠3 are the base angles.



In this diagram, the
base angles are ______ and ______; the vertex angle is ________.



Theorems Isosceles Triangle

4.10 Isosceles Triangle Theorem
If two sides of a triangle are congruent, then the angles opposite those sides are congruent.

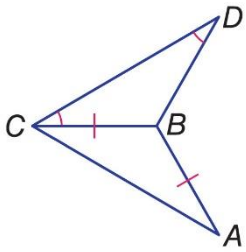
Example If $\overline{AC} \cong \overline{BC}$, then $\angle 2 \cong \angle 1$.

4.11 Converse of Isosceles Triangle Theorem
If two angles of a triangle are congruent, then the sides opposite those angles are congruent.

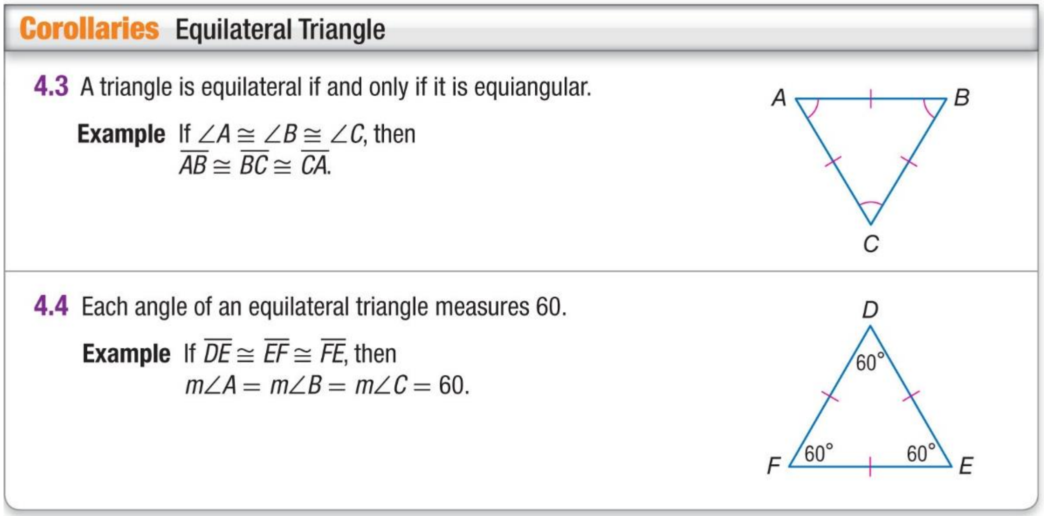
Example If $\angle 1 \cong \angle 2$, then $\overline{FE} \cong \overline{DE}$.

Example 4-6-1: **Congruent Segments and Angles**

A. Name two unmarked congruent angles.



B. Name two unmarked congruent segments.



Corollaries Equilateral Triangle

4.3 A triangle is equilateral if and only if it is equiangular.

Example If $\angle A \cong \angle B \cong \angle C$, then
$\overline{AB} \cong \overline{BC} \cong \overline{CA}$.

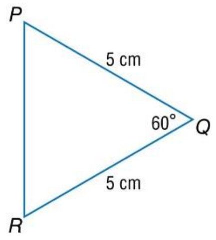
4.4 Each angle of an equilateral triangle measures 60.

Example If $\overline{DE} \cong \overline{EF} \cong \overline{FE}$, then
$m\angle A = m\angle B = m\angle C = 60$.

Example 4-6-2: **Find Missing Measures**

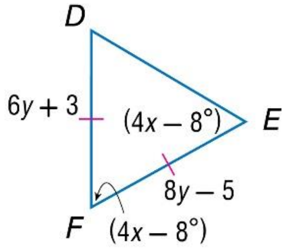
A. Find $m\angle R$.

B. Find PR.

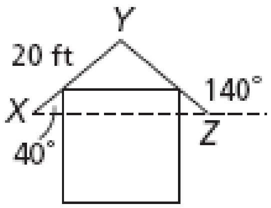


Example 4-6-3: **Find Missing Values**

Find the value of each variable.

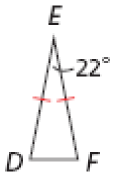


Example 4-6-4: The length of $\overline{YX}$ is 20 feet. Explain why the length of $\overline{YZ}$ is the same.

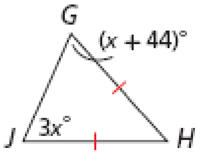


Example 4-6-5: Find each angle measure.

a. m∠ F

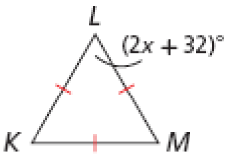


b. m∠G

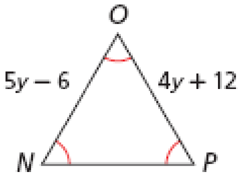


Example 4-6-6: – Find each value.

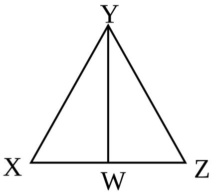
a. *x*



b. *y*



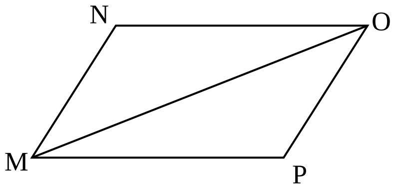
Example 4-6-8:



Given: $\overline{YW}$ bisects $\overline{XZ}$ $\overline{XY} \cong \overline{YZ}$
Prove: $\angle XYW \cong \angle ZYW$

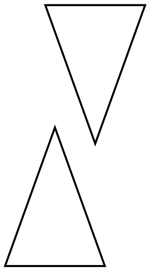
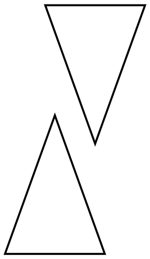
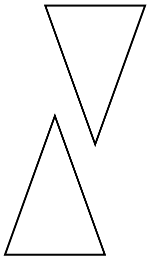
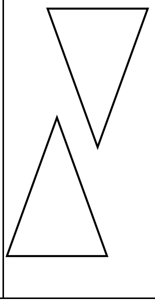
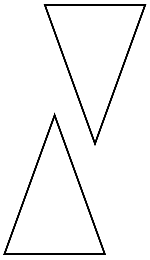
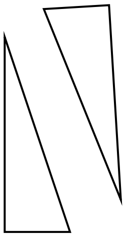
Statements	**Reasons**
1. $\overline{YW}$ bisects $\overline{XZ}$ $\overline{XY} \cong \overline{YZ}$	1. Given
2. $\overline{XW} \cong \overline{WZ}$	2.
3. $\overline{YW} \cong \overline{YW}$	3.
4. $\Delta\, XYW \cong \Delta\, ZYW$	4.
5. $\angle XYW \cong \angle ZYW$	6.

Example 4-6-9: Using CPCTC with another Thm.



Given: $\overline{NO} \parallel \overline{MP}, \angle N \cong \angle P$
Prove: $\overline{MN} \parallel \overline{OP}$

Statements	**Reasons**
1. $\overline{NO} \parallel MP, \angle N \cong \angle P$	1. Given
2. $\angle NOM \cong \angle PMO$	2.
3. $\overline{MO} \cong \overline{MO}$	3.
4. $\Delta\, MNO \cong \Delta\, OPM$	4.
5. $\angle NMO \cong \angle POM$	5.
6. $\overline{MN} \parallel \overline{OP}$	6.

	Def of $\Delta \cong$	SSS	SAS	ASA	AAS	HL
Words	All $\angle's \cong$ All sides $\cong$	All 3 sides $\cong$	2 sides $\cong$ & Included angle $\cong$	2 $\angle's$ and included side $\cong$	2 $\angle's$ and un-included side $\cong$	Hypotenuse Leg in a right Δ
Pictures						

Objectives:

1. Position and label triangles for use in coordinate proofs.
2. Write coordinate proofs.

Apply the <u>distance formula</u> to all 3 sides of each triangle:

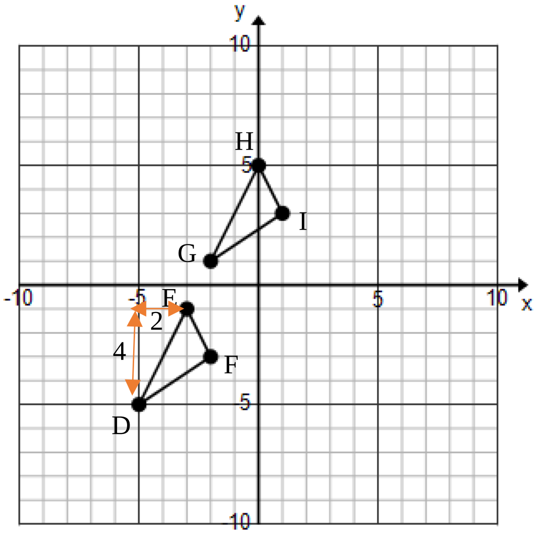
$d = \sqrt{(y_2 - y_1)^2 + (x_2 - x_1)^2}$

or

d = $\sqrt{(leg)^2 + (leg)^2}$

Example 4-8-1: Proof in the Coordinate Plane

Given: $D(-5, -5), E\ (-3, -1), F\ (-2, -3),$
$G(-2, 1), H\ (0, 5)$ and $I\ (1, 3)$
Prove: $\angle DEF \cong \angle GHI$



$DE = \sqrt{(-1 - -5)^2 + (-3 - -5)^2}$

Or $\sqrt{(4)^2 + (2)^2}$ = _____

$EF =$

$FD =$

$GH =$

$HI =$

$IG =$

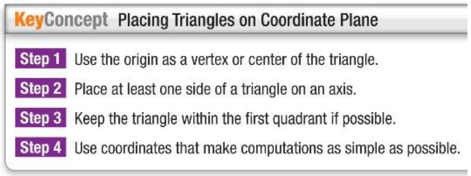
a) $\Delta\, XYW \cong \Delta\, ZYW$? Yes No

If yes, how? ______________

b) $\angle DEF \cong \angle GHI$ by ________

Strategies for doing Coordinate Proof

1. Use origin as a vertex
2. center figure at the origin
3. center side of figure at origin
4. use axes as sides of figure



KeyConcept Placing Triangles on Coordinate Plane

Step 1 Use the origin as a vertex or center of the triangle.

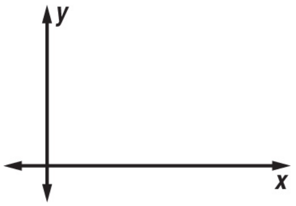
Step 2 Place at least one side of a triangle on an axis.

Step 3 Keep the triangle within the first quadrant if possible.

Step 4 Use coordinates that make computations as simple as possible.

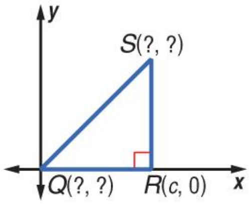
Example 4-8-2: **Position and Label a Triangle**

Position and label right triangle *XYZ* with leg ***d* units** long on the coordinate plane.



Example 4-8-3: **Identify Missing Coordinates**

Name the missing coordinates of isosceles right triangle *QRS*.

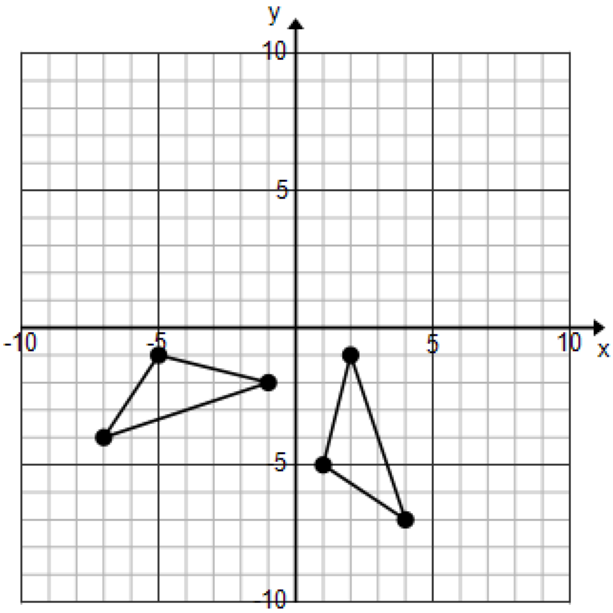


Example 4-8-4: SSS on the Coordinate Plane

Triangle DVW has vertices $D(-5,-1), V(-1,-2)$, and $W(-7,-4)$. Triangle LPM has vertices $L(1,-5), P(2,-1)$, and $M(4,-7)$.

a) Graph both triangles on the same coordinate plane.

b) Use your graph to make a conjecture as to whether the triangles are congruent. Explain your reasoning.



c) Write a logical argument that uses coordinate geometry to support the conjecture you made in part b.

Apply the <u>distance formula</u> to all 3 sides of each triangle:

$$\sqrt{(y_2-y_1)^2+(x_2-x_1)^2} \quad \text{or} \quad d = \sqrt{(leg)^2+(leg)^2}$$

$DV = \sqrt{(-1--5)^2+(-2--1)^2}$ or d = $\sqrt{(5)^2+(1)^2}$

$VW =$

$WD =$

$LP =$

$PM =$

$ML =$