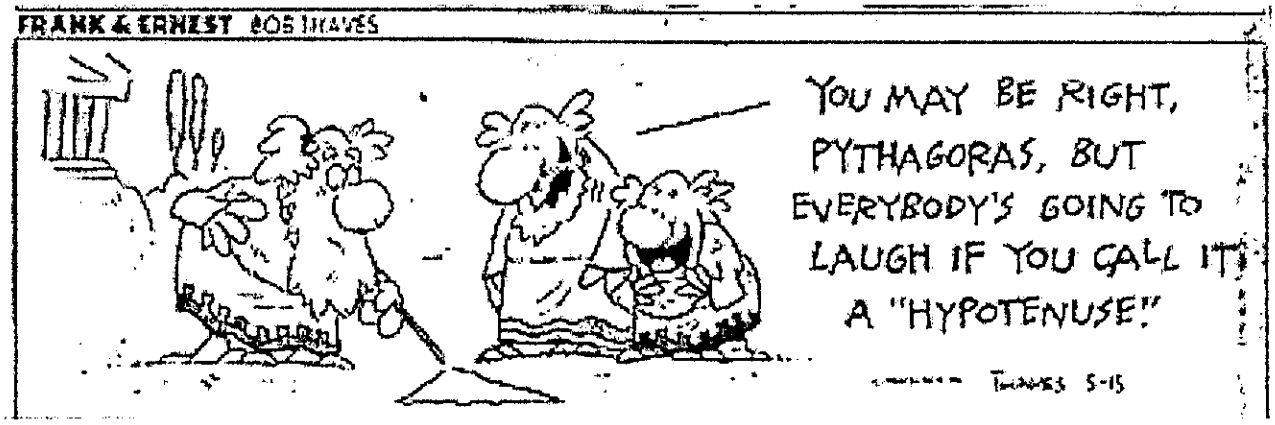
Name: _____

Hour: _____

Unit C: Triangles

Geometry 1st Semester



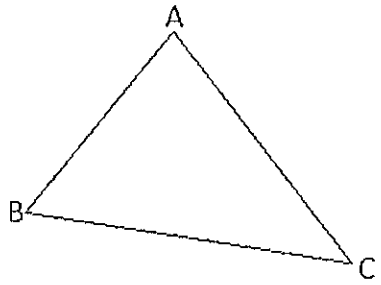
Lesson 2-7: Triangle Inequality

Vocabulary

Triangle Inequality Postulate: _____

_____

So, for triangle ABC below, this postulate means three things:



1.

2.

3.

Practice

1. Is it possible to have a triangle with side lengths 3, 5, 9? Explain...

2. Is it possible to have a triangle with side lengths 3, 7, 9? Explain...

3. Two sides of a triangle are 15 and 20.

   a. The third side must be longer than what length? Why?

   b. The third side must be shorter than what length? Why?

   c. If the third side is called *x*, write an inequality showing its possible lengths.

4. The distance from Roberto's house to the Junior High is 1 mile. The distance from Ian's house to the Junior High is 3.6 miles. Write an inequality about the possible distances between Roberto and Ian's houses.

5. A triangle has two side lengths of 10 and 3.

   a. The third side must be longer than what length? Why?

   b. The third side must be shorter than what length? Why?

   c. If the third side is called x, write an inequality showing its possible lengths.

6. Can a triangle have side lengths:

   a. 3cm, 8cm, 6cm?

   b. 3cm, 8cm, 5cm?

   c. 3cm, 3cm, 3cm?

Lesson 7-9: Unequal Sides & Angles Theorem

Vocabulary

Unequal Sides Theorem: _____

_____

Example

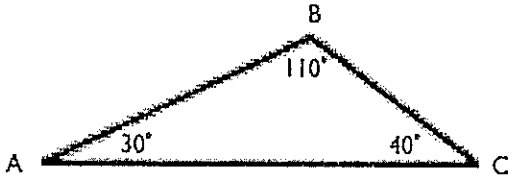
Unequal Angles Theorem: _____

_____

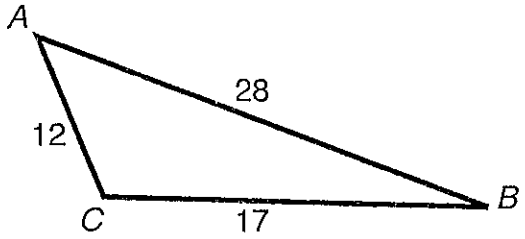
Example

Practice

1. Put the sides of ΔABC in order from smallest to largest.



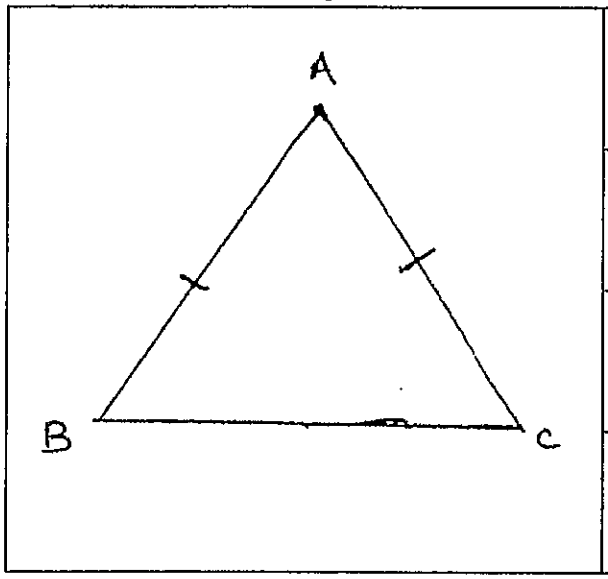
2. Put the angles of ΔABC in order from smallest to largest.



Lesson 6-2: Isosceles Triangles

Vocabulary

Parts of an Isosceles Triangle:



Two Congruent Sides
Vertex Angle
Base Angles
Base

Isosceles Triangle Symmetry Theorem: _____

_____

Isosceles Triangle Coincidence Theorem: _____

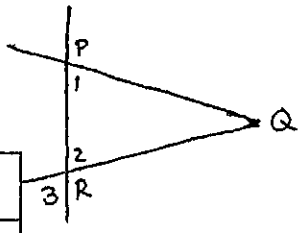
_____

Isosceles Triangle Base Angles Theorem (ITBAT): _____

_____

Practice

1. Given: The figure at the right, with $PQ = QR$.
   Prove: $m\angle 1 = m\angle 3$.



Conclusions	Justifications
1.	Given
2. $m\angle 1 = m\angle 2$	
3.	Vertical Angles
4. $m\angle 1 = m\angle 3$	

Vocabulary

Equilateral Triangles have..._____ equal sides & _____ lines of symmetry.

Equilateral Triangle Symmetry Theorem: _____

_____

Equilateral Triangle Angle Theorem: _____

_____

Equiangular: _____

_____

Corollary: _____

_____

Lesson 5-1: Corresponding Parts of Congruent Figures

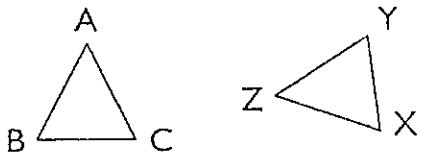
Vocabulary

Corresponding Parts of Congruent Figures Theorem (CPCF Theorem): _____

_____

_____

Example



If $\Delta ABC \cong \Delta ZYX$, then by CPCF:

ABCD Theorem: _____

_____

Equivalence Properties of Congruence: For any figure F, G, and H:

a) _____

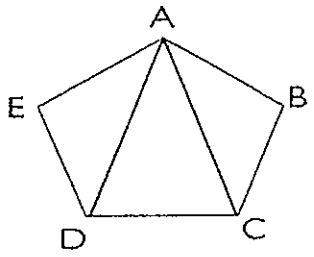
b) _____

c) _____

Practice

1. $\Delta TOP \cong \Delta JKL$. List the six pairs of congruent parts. Sketch a possible situation and mark the congruent parts.

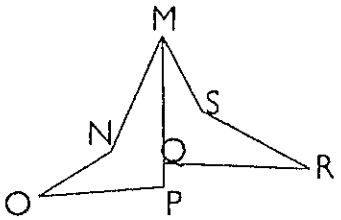
2. ABCD ≅ AEDC.



a. List all pairs of congruent parts.

b. Name two triangles which are isosceles.

3. Suppose MNOP ≅ RSMQ. Using the ABCD Theorem:



a. Which angle has measure equal to m∠PMN.

b. Which segment has length equal to NP?

Lesson 7-2: Triangle Congruence Theorems

Vocabulary

Congruence Theorem	Picture
SSS Triangle Congruence Theorem:	
SAS Triangle Congruence Theorem:	
ASA Triangle Congruence Theorem:	
AAS Triangle Congruence Theorem:	

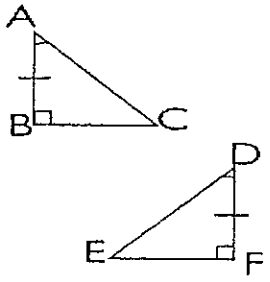
Practice

For #1-4, a) tell whether the triangles are congruent, b) justify with a triangle congruence theorem, c) indicate the corresponding vertices. Otherwise, write "Not enough information."

1. a.

   b.

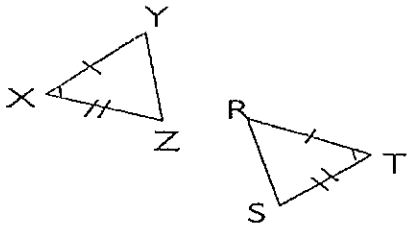
   c.



2. a.

   b.

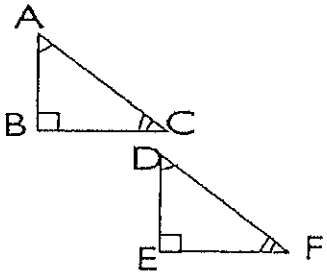
   c.



3. a.

   b.

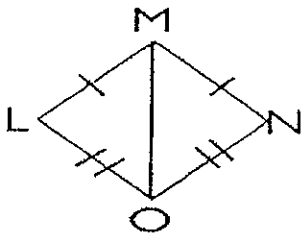
   c.



4. a.

   b.

   c.



Lesson 7-3: Proofs Using Triangle Congruence

Vocabulary

Justification: _____

_____

Isosceles Triangle Bases Angles Converse Theorem (ITBAT Converse): _____

_____

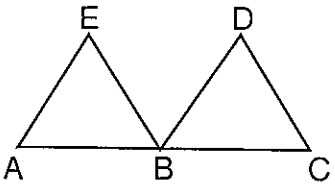
_____

Regular Figure: _____

_____

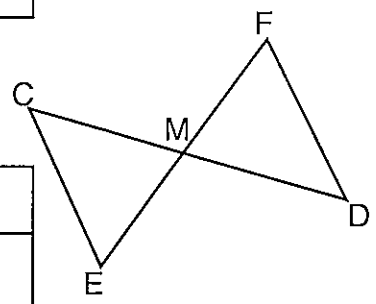
Practice

1. Given: In the figure below, $\angle EBA \cong \angle DBC$, B is the midpoint of AC, and $\angle A \cong \angle C$
   Prove: $\Delta ABE \cong \Delta CBD$.



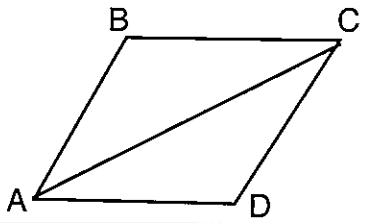
Conclusions	Justifications
0. $\angle EBA \cong \angle DBC$, B is the midpoint of AC, and $\angle A \cong \angle C$	
1. $AB \cong BC$	
2. $\Delta ABE \cong \Delta CBD$	

2. Given: M is the midpoint of CD and EF.
   Prove: $\Delta CME \cong \Delta DMF$.



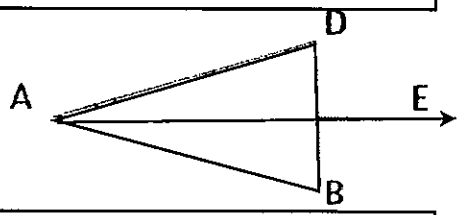
Conclusions	Justifications
0.	Given
1.	Definition of midpoint
2.	Vertical Angle Theorem
3.	SAS Triangle Congruence

3. Given: AB ≅ CD, BC ≅ AD.
Prove: ∠B ≅ ∠D.



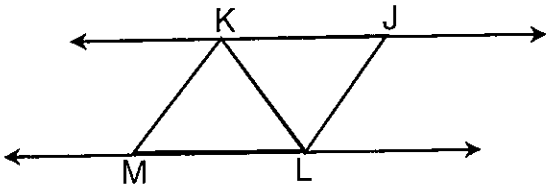
Conclusions	Justifications
0. AB ≅ CD, BC ≅ AD	
1. AC ≅ AC	
2. ΔABC ≅ ΔCDA	
3. ∠B ≅ ∠D	

4. Given: AE bisects ∠BAD and ∠B ≅ ∠D.
Prove: ΔABC ≅ ΔADC.



Conclusions	Justifications
0.	
1. ∠BAC ≅ ∠DAC	
2. AC ≅ AC	
3. ΔABC ≅ ΔADC	

5. Given: KJ // ML and KJ ≅ LM.
Prove: ΔKJL ≅ ΔLMK.



Conclusions	Justifications
0.	
1.	// Lines →AIA ≅ Theorem
2.	Reflexive Property of Congruence
3.	SAS Δ ≅ Theorem

Lesson 7-4: Overlapping Triangles

Vocabulary

Overlapping Figures: _____

_____

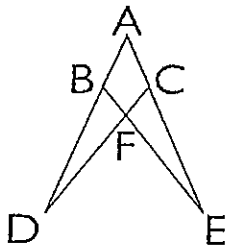
Example

Non-overlapping Figures: _____

_____

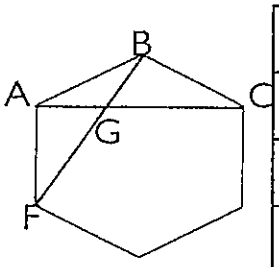
Practice

1. Given: AC = AB and AD = AE.
   Prove: ∠D ≅ ∠E.



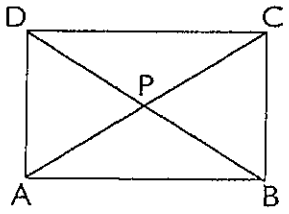
Conclusions	Justifications
0. AC = AB and AD = AE	
1. ∠CAD ≅ ∠BAE	
2. ΔADC ≅ ΔAEB	
3. ∠D ≅ ∠E	

2. Given: Regular hexagon ABCDEF.
   Prove: BF ≅ AC.



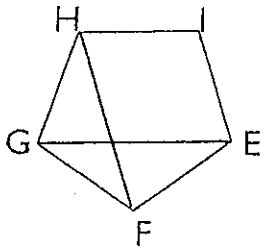
Conclusions	Justifications
0. Regular hexagon ABCDEF	
1. AF ≅ BC	
2. ∠FAB ≅ ∠ABC	
3. AB ≅ AB	
4.	SAS ≅ Theorem
5.	CPFC

3. Given: PA ≅ PB, CA ≅ DB.
Prove: DA ≅ CB.



Conclusions	Justifications
0.	
1. BA ≅ AB	
2.	Isosceles Triangle Base Angles Theorem (ITBAT)
3.	SAS Δ ≅ Theorem
4.	CPCF

4. Given: Regular pentagon EFGHI.
Prove: EG ≅ FH.



Conclusions	Justifications
0. Regular pentagon EFGHI	
1. EF ≅ GH	
2. ∠EFG ≅ ∠FGH	
3. FG ≅ FG	
4. ΔEFG ≅ ΔFGH	
5. EG ≅ FH.	

Lesson 7-5: SsA & HL Congruence

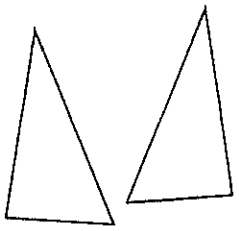
Ever wondered why we never use SSA? Well, we will start to use it here...but we never actually call it SSA, this is because it only works in specific cases. The two specific cases are SsA and HL.

Vocabulary

SsA Congruence: _____

_____

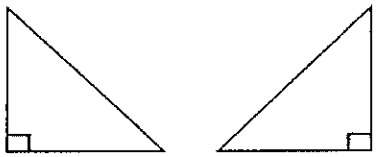
Example



HL Congruence: _____

_____

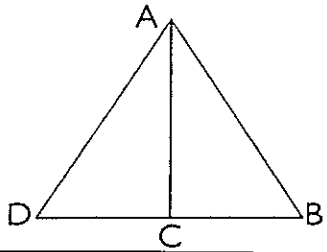
Example



Practice

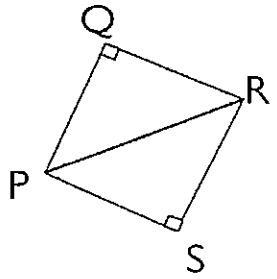
1. A high fence is perpendicular to the ground. Jack leans a 12' ladder against the fence. On the other side of the fence, Jill also leans a 12' ladder against the fence, reaching the same height as the first ladder. Why is it no surprise that the two ladders touch the ground at the same distance from the fence?

2. Given: AC ⊥ BD and AD = AB.
   Prove: ΔABC ≅ ΔADC.



Conclusions	Justifications
0.	
1. AC ≅ AC	
2. ΔABC ≅ ΔADC	

3. Given: PQ ≅ RS, ∠Q and ∠S are right angles.
Prove: ∠QPR ≅ ∠SRP



Conclusions	Justifications
0.	
1. PR ≅ PR	
2. ΔPQR ≅ ΔRSP	
3. ∠QPR ≅ ∠SRP	

4. Given: $\overline{AB} \cong \overline{XY}$, $\overline{AC} \cong \overline{XZ}$, $\angle C \cong \angle Z$ and $XY > XZ$.
Are ΔABC and ΔXYZ congruent? Justify with a congruence statement and indicate the corresponding vertices.