**GEOMETRY**
**1st Semester Final Review – Chapter 4 - 5** **Name _____**

1. Complete the table below by naming each type of triangle and describing the angles or sides that distinguish it.

| CLASSIFICATIONS of TRIANGLES | | | |
|---|---|---|---|
| **ANGLES** | | **SIDES** | |
| **Name** | **Description** | **Name** | **Description** |
| | | | |
| | | | |
| | | | |
| | | | |

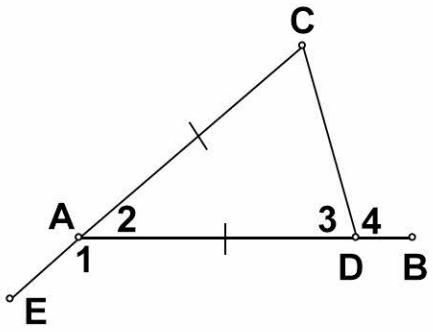
2. If two triangles are congruent, then what 2 characteristics are true:

   a. _____

   b. _____

3. Prove the 180 Theorem

4. Using the figure at the right, answer each of the following independent questions:



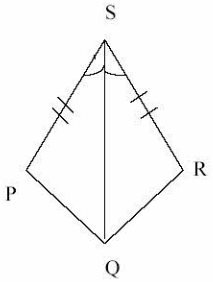

a. If m $\angle$ 2 = 34,
then m $\angle$ 4 = _____

b. If m $\angle$ C = 72,
then the m $\angle$ 1 = _____

c. If m $\angle$ 4 is 140,
then m $\angle$ 2 = _____

5. Determine whether each pair of triangles is **congruent** based on the markings shown. If so, write the congruence postulate or theorem supporting your conclusion and name the **pairs** of sides or angles that support it. If not, write "NOT CONGRUENT".

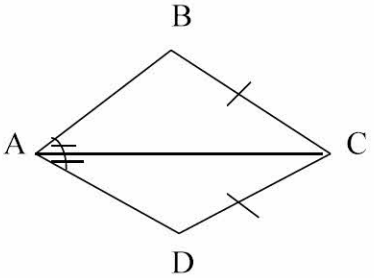
a.




Congruent? _____

Post./Theorem: _____

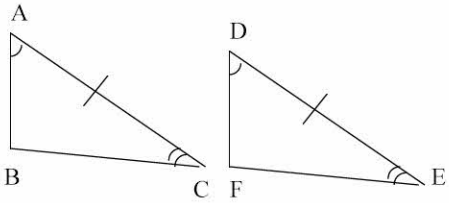
b.




Congruent? _____

Post./Theorem: _____

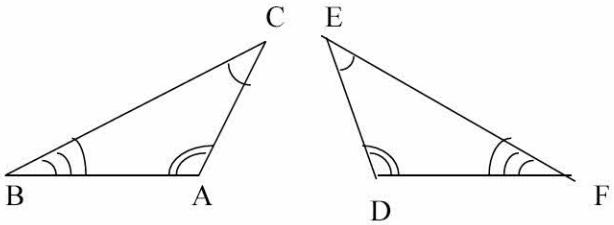
c.




Congruent? _____

Post./Theorem: _____

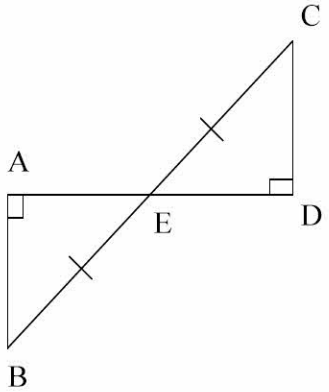
d.




Congruent? _____

Post./Theorem: _____

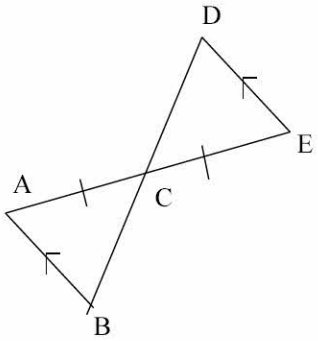
e.




Congruent? _____

Post./Theorem: _____

f.




Congruent? _____

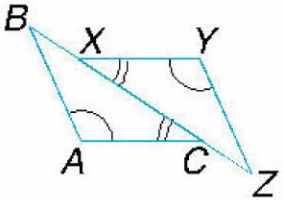
Post./Theorem: _____

6. **Given:** $\angle A \cong \angle Y$

$\angle ACB \cong \angle YXZ$

$\overline{BX} \cong \overline{ZC}$

**Prove:** $\triangle ABC \cong \triangle YZX$




7. What does CPCTC mean? _____

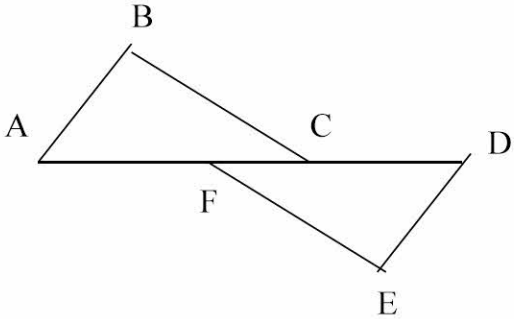
_____

8. **Given:** $\overline{AB} \parallel \overline{DE}$

AC = FD

AB = DE

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



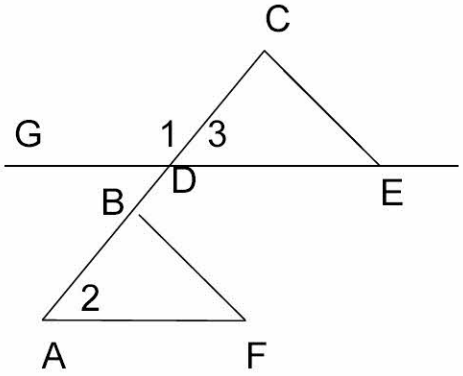
9. **Given:**

$\overline{AD} \cong \overline{CB}$

$\overline{CE} \parallel \overline{BF}$

$\angle 1$ and $\angle 2$ are supplementary

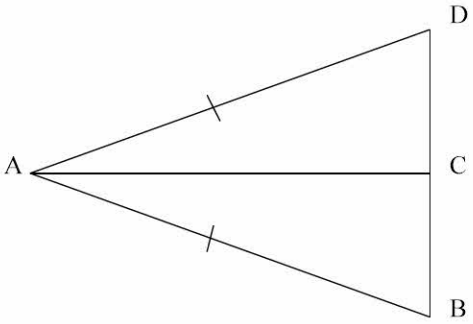
**Prove:** $\Delta$ CED $\cong$ $\Delta$ BFA




10. **Given:** $\overline{AC}$ bisects $\angle$BAD

AD = AB

**Prove:** $\overline{AC}$ bisects $\overline{BD}$

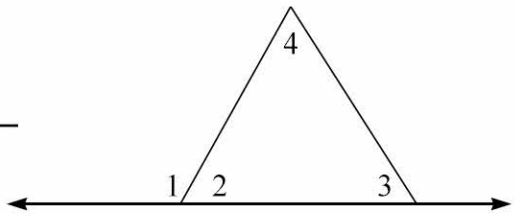



11. m$\angle$1 = 2x + 45

m$\angle$3 = 2x – 5

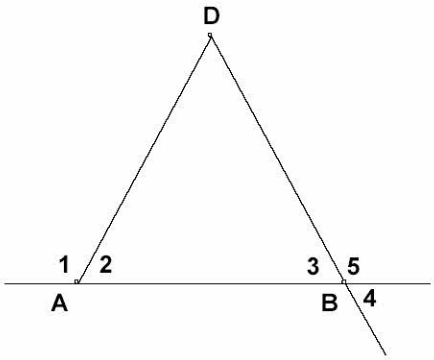
m$\angle$4 = x + 10

**m$\angle$2 = ____**




12. Given: $\angle 2 \cong \angle 4$

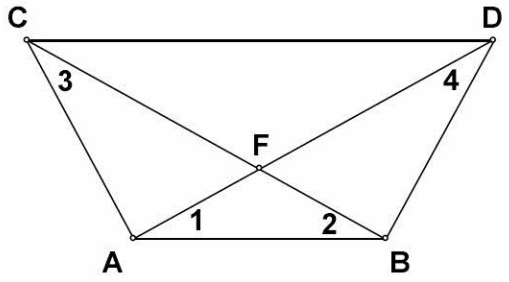
Prove: $\overline{\mathbf{AD}} \cong \overline{\mathbf{DB}}$



13. Given: $\angle 3 \cong \angle 4$

$\overline{CA} \cong \overline{DB}$

Prove: $\overline{AF} \cong \overline{BF}$




14. Which side of $\Delta$ ABC is the LONGEST if m $\angle$ A = 37 and m $\angle$ B = 48.

_____

15. Which angle of $\Delta$ ABC is the SMALLEST if AB = 9, BC = 10 and AC = 15?

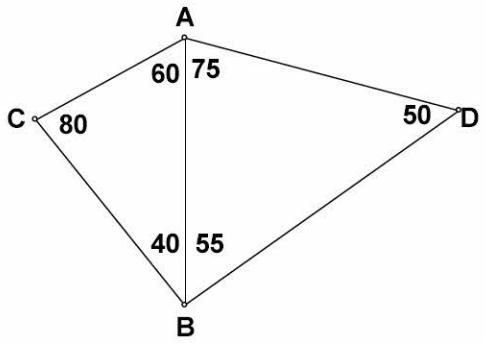
_____

16. Refer to the drawing to the right.

Name the LONGEST **side:** _____

Why? _____

_____




17. Determine whether the given numbers could represent lengths of the sides of a triangle. (**Yes or No**).

Show computations to justify your answer.

a. 8, 8, 5 _____

b. 7, 18, 6 _____

c. 10, 3, 6 _____

18. In $\triangle$ ABC, AB = 6 and BC = 10.

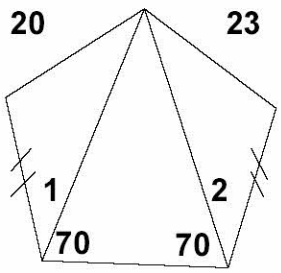
What are the *restrictions* on the length of $\overline{\mathbf{AC}}$?

19. Complete using >, < or = :

m $\angle$ 2 _____ m $\angle$ 1

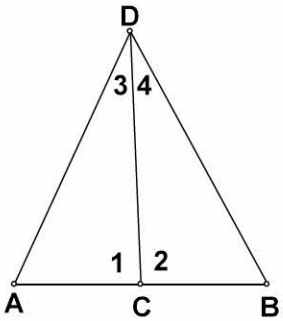
Why? _____

_____



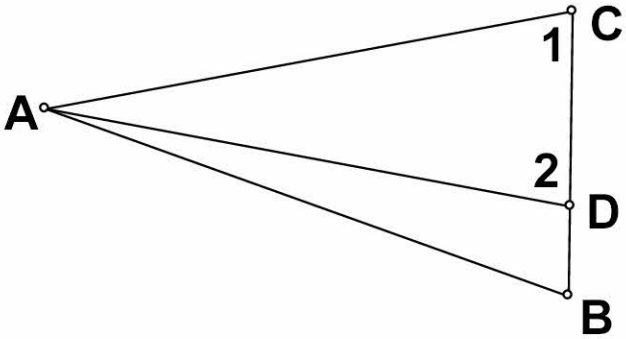

20. Given: **m $\angle$A > m $\angle$B**
**AC = CB**

Prove: **m $\angle$ 2 > m $\angle$ 1**

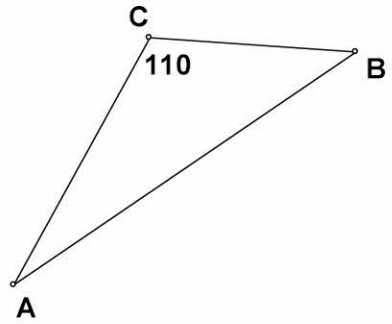



24. Given: **$\angle$ 1 $\cong$ $\angle$ 2**
**AB > CA**

Prove: **AB > AD**



25. In the figure to the right,

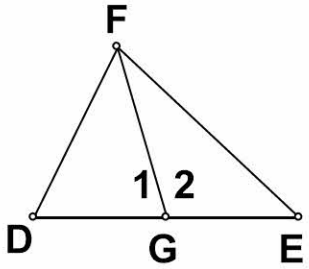



a. Draw and Label an Altitude.

b. Draw and Label a median.

c. Draw and Label the Perpendicular Bisector of $\overline{AC}$.

26. In $\triangle$ DEF, $\overline{FG}$ is a median.




m $\angle$ 1 = 5x + 20

m $\angle$ 2 = 8x + 30

a. x = _____

b. which side is longer, FD or FE? _____

c. Which angle is larger, $\angle$ D or $\angle$ E. _____

# GEOMETRY 1ST SEMESTER FINAL EXAM REVIEW
## PART #2 - Answers / Hints

1. See class notes
2. a. All pairs of corresponding angles are $\cong$.
   b. All pairs of corresponding sides are $\cong$.
3. See class notes.
4. a. $m\angle 4 = 107$
   b. $m\angle 1 = 144$
   c. $m\angle 2 = 100$

5. a. YES - SAS
   b. No
   c. YES - ASA
   d. No
   e. YES - AAS
   f. YES - AAS

6.

| | |
|---|---|
| AA $\angle A \cong \angle Y$, $\angle ACB \cong \angle YXZ$ | Given |
| $\overline{BX} \cong \overline{ZC}$ | Given |
| $BX + XC = BC$; $XC + ZC = XZ$ | Segment Addition Postulate |
| $ZC + XC = BC$ | Substitution |
| S $BC = XZ$ | Substitution |
| $\triangle ABC \cong \triangle YZK$ | SAA |

7. Corresponding Parts of Congruent Angles are Congruent.

| | | |
|---|---|---|
| 8. | $\overline{AB} \parallel \overline{DE}$ | Given |
| S | $AC = FD$, $AB = DE$ | Given |
| A | $\angle BAD \cong \angle CDE$ | Alternate Interior $\angle$'s $\cong$ |
| | $\triangle ABC \cong \triangle DEF$ ~~A~~ | SAS |
| 9. | $\overline{AD} \cong \overline{CB}$ | Given |
| | $\overline{CE} \parallel \overline{BF}$ | Given |
| | $\angle 1$ and $\angle 2$ are Supplementary | Given |
| | $AB + BD = AD$ | Segment Addition Postulate |
| | $DC + BD = CB$ | Segment Addition Postulate |
| | $AB + BD = DC + BD$ | Substitution |
| | $-BD \quad -BD$ | |
| S | $AB = DC$ | Algebra |
| | $\angle 1$ and $\angle 3$ are Supplementary | Linear Pair |
| A | $\angle 2 \cong \angle 3$ | $\cong$ Supplements Theorem |
| A | $\angle ECD \cong \angle FBA$ | Corresponding $\angle$'s are $\cong$ |
| | $\triangle CED \cong \triangle BFA$ ~~A~~ | ASA |
| 10. | $\overline{AC}$ bisects $\angle BAD$ | Given |
| S | $AD = AB$ | Given |
| S | $AC = AC$ | Reflexive |
| A | $\angle CAD \cong \angle CAB$ | Definition of $\angle$ ~~B~~ |
| | $\triangle ACD \cong \triangle ACB$ | SAS |
| | $DC = CB$ | CPCTC |
| | $\overline{AC}$ bisects $\overline{BD}$ ~~A~~ | Definition of Segment ~~B~~ |

10.

11. $m\angle 1 = m\angle 4 + m\angle 3$

$2x + 45 = x + 10 + 2x - 5$

$40 = x$

$m\angle 2 = 55$

| | |
|---|---|
| 12. $\angle 2 \cong \angle 4$ | Given |
| $\angle 3 \cong \angle 4$ | Vertical $\angle$'s |
| $\angle 2 \cong \angle 3$ | Substitution |
| $\overline{AD} \cong \overline{DB}$ AH | Base $\angle$'s $\cong \rightarrow \cong$ legs |

| | |
|---|---|
| 13. A $\angle 3 \cong \angle 4$ | Given |
| S $\overline{CA} \cong \overline{DB}$ | Given |
| A $\angle AFC \cong \angle BFD$ | Vertical $\angle$'s |
| $\triangle CAF \cong DBF$ | AAS |
| $\overline{AF} \cong \overline{DF}$ | CPCTC |

14 AB ($m\angle C = 95$)

15. $\angle C$

16. $\overline{BD}$ CB or CA < AB but AB < BD

17. a Yes $(8+5) > 8$

b No $(7+6) \not> 18$

c. No $(3+6) \not> 10$

18. $4 < AC < 16$

19. $m\angle 2 \geq m\angle 1$ SSS Inequality

| | |
|---|---|
| 20. $m\angle A > m\angle B$ | Given |
| S $AC = CB$ | Given |
| S $DB > DA$ | Biggest ∠ → Longest Side |
| S $DC = DC$ | Reflexive |
| $m\angle 2 > m\angle 1$ | SSS Inequality |

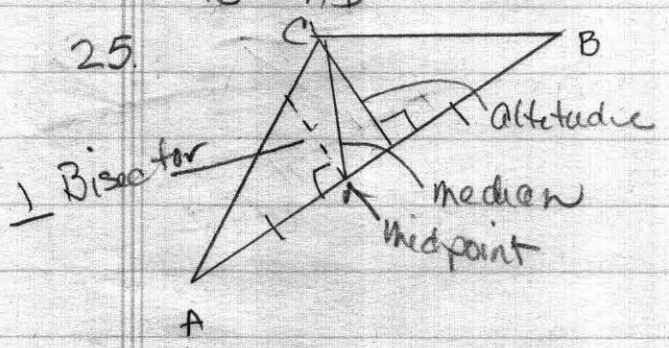
21. See class notes

22. See class notes

23. Yes - 2 pairs of sides are ≅ Yes - One pr. of sides is ≅ and ∥

| | |
|---|---|
| 24. $\angle 1 \cong \angle 2$ | Given |
| $AB > CA$ | Given |
| $AC = AD$ | ≅ Base ∠s → ≅ legs |
| $AB > AD$ | Substitution |

25.




26. a $x = \frac{10}{3}$

b. $FE > FD$

c. $m\angle D > m\angle E$ (Longest Side → Biggest ∠)