# Unit 8: Congruence and Similarity Part 2

**State Standards:**

- **NC.M2.G-CO.6:** Determine whether two figures are congruent by specifying a rigid motion or sequence of rigid motions that will transform one figure onto the other.
- **NC.M2.G-CO.7:** Use the properties of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.
- **NC.M2.G-CO.8:** Use congruence in terms of rigid motion. Justify the ASA, SAS, and SSS criteria for triangle congruence. Use criteria for triangle congruence (ASA, SAS, SSS, HL) to determine whether two triangles are congruent.
- **NC.M2.G-CO.9:** Prove theorems about lines and angles and use them to prove relationships in geometric figures.
- **NC.M2.G-SRT.2:** Understand similarity in terms of transformations.
- **NC.M2.G-SRT.3:** Use transformations (rigid motions and dilations) to justify the AA criterion for triangle similarity.
- **NC.M2.G-SRT.4:** Use similarity to solve problems and to prove theorems about triangles. Use theorems about triangles to prove relationships in geometric figures.

| | | |
|---|---|---|
| Day 1:<br>Wed. 12/7 | CPCTC | HW 8-1 |
| Day 2:<br>Thurs. 12/8 | Triangle Congruence (SSS, ASA, SAS)<br>With proofs Proofs | HW 8-2 |
| Day 3:<br>Fri. 12/9 | Triangle Congruence (HL and AAS)<br>With proofs | HW 8-3 |
| Day 4:<br>Mon. 12/12 | Quiz (days 1-3)<br><br>More Proof Practice | HW 8-4 |
| Day 5:<br>Tues. 12/13 | Isosceles Triangle Theorem (ITT) & Converse<br><br>Perpendicular Bisectors & Angle Bisectors | HW 8-5 |
| Day 6:<br>Wed. 12/14 | Review for Unit 8 Test | Review sheet |
| Day 7:<br>Thurs. 12/15 | **Unit 8 Test** | Unit 9 Placemat |

Name: _____

I. $\triangle PQR \cong \triangle ABC$. Find the values of x and y.

1. $m\angle R = 5x + 70, \ m\angle C = 24x - 25, \ QR = 4y + 2, \ BC = x + y$

2. $m\angle R = 90 - y, \ m\angle C = 13, \ PR = 3x + y - 1, \ AC = 32 - x$

3. $PQ = 5x - 31, \ QR = -3y - 1, \ BC = x + 1, \ AB = 9 - y$

4. $m\angle A = 15y - 3, \ m\angle P = 43 - x, \ PQ = 11 - x, \ AB = 3y + 1$

5. $AB = 2x + y, \ PQ = 7, \ BC = 11, \ QR = 4x + y$

6. $\triangle XYZ \cong \triangle MNO, \ m\angle X = x + 10, \ m\angle M = y + 20, \ m\angle Y = 3x,$ and $m\angle N = x + 3y$. Find $m\angle X$ and $m\angle Y$.

II. Indicate which triangles are congruent. Be sure to have the correspondence of the letters correct.

a. $\triangle ERC \cong$ _____

Why is $\overline{RC} \cong \overline{RC}$?
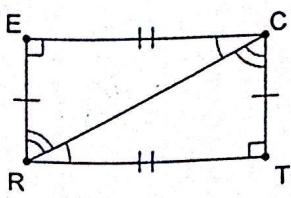
b. E is the midpoint of $\overline{TP}$

$\triangle SPE \cong$ _____
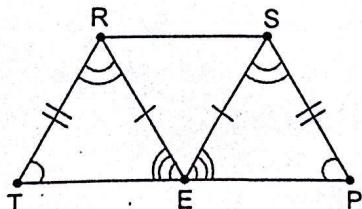
c. $\triangle BOW \cong$ _____
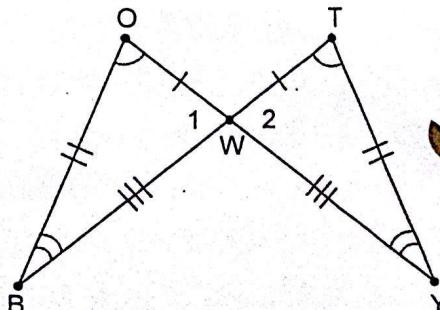
Why is $\angle 1 \cong \angle 2$?

## State how $\triangle$s could be proven $\cong$. If not $\cong$, state NONE.

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____
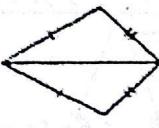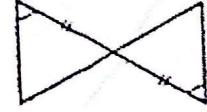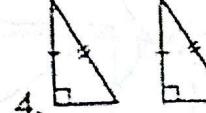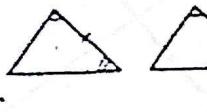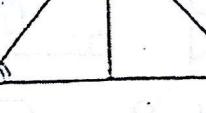
7. _____

8. _____

9. _____
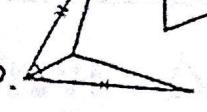
10. _____
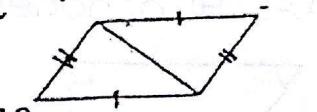
11. _____
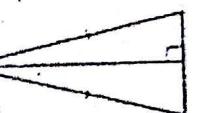
12. _____
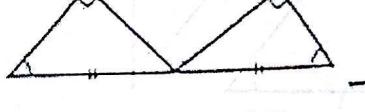
13. _____
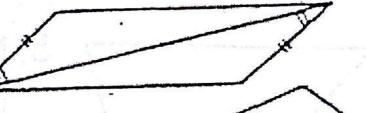
14. _____
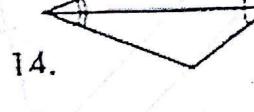
15. _____
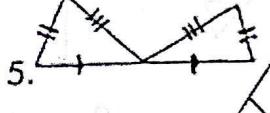
16. _____
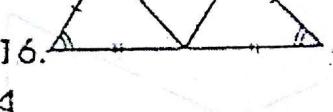
17. _____
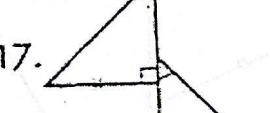
① given: M is midpoint of $\overline{XY}$
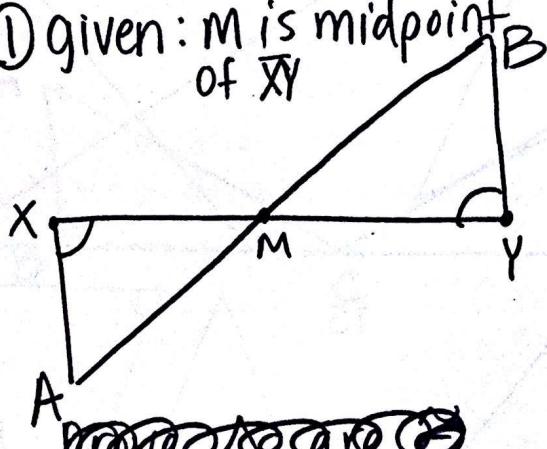
~~Prove $\triangle$s are $\cong$~~

Prove $\angle A \cong \angle B$
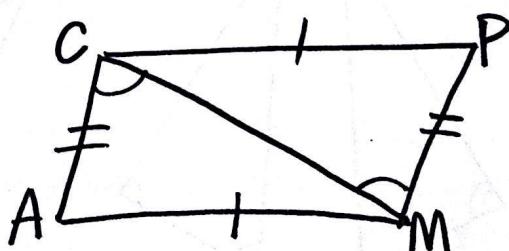
② Prove $\triangle$s are $\cong$.

# More Congruent Triangles

Identify which property will prove these triangles congruent. (SSS, SAS, ASA, AAS, HL or none)

1. 

2. 

3. 

4. 

5. 

6. 

7. 

8. 

9. 

10. 

11. 

12. 

13. 

14. 

15. 
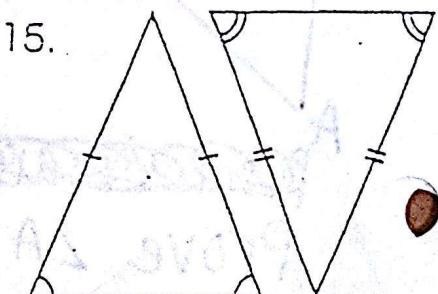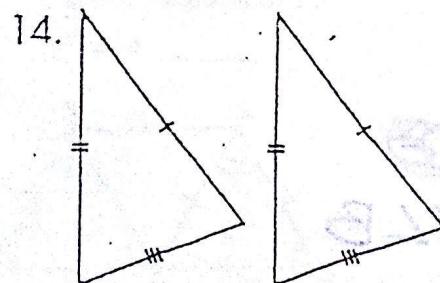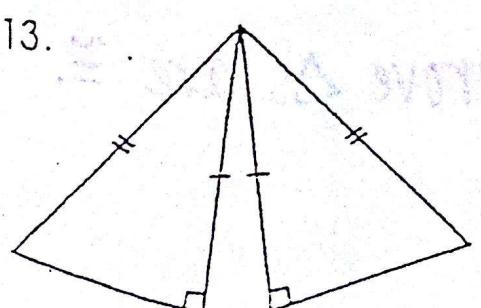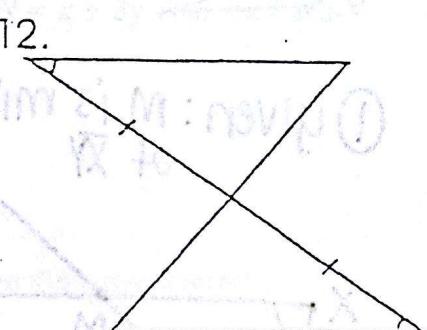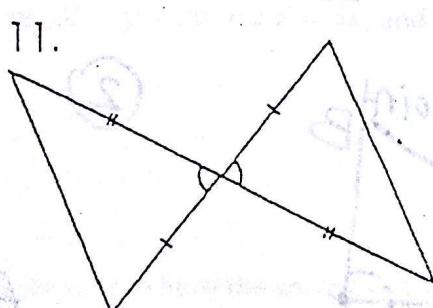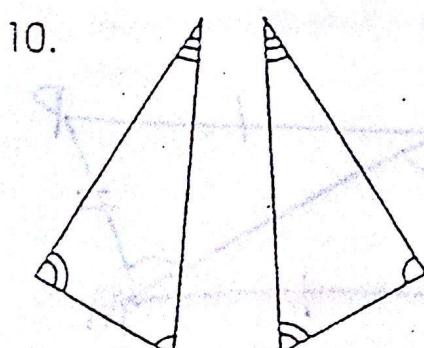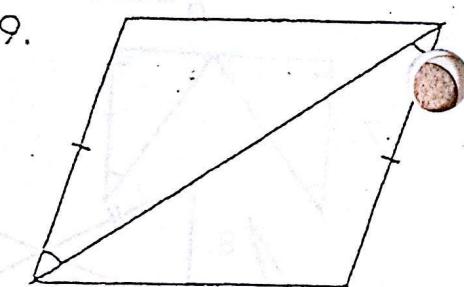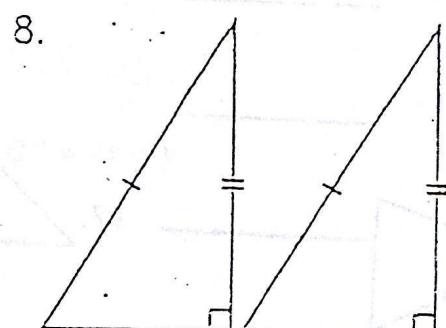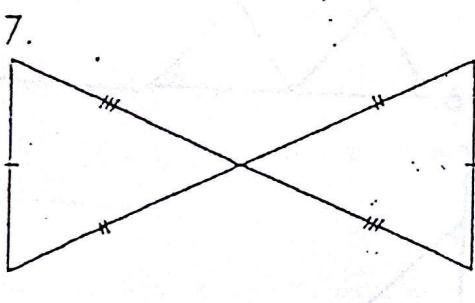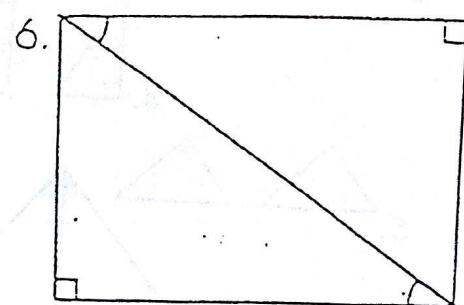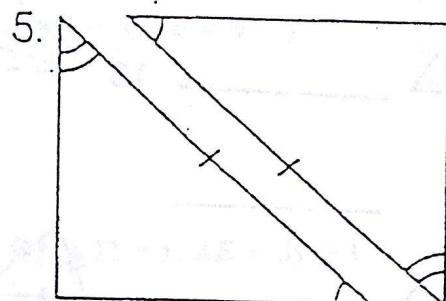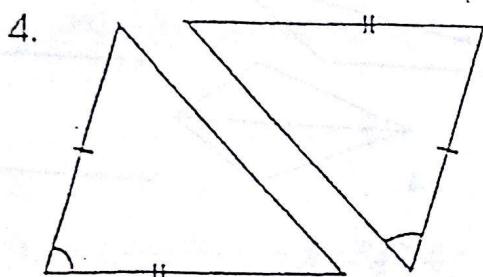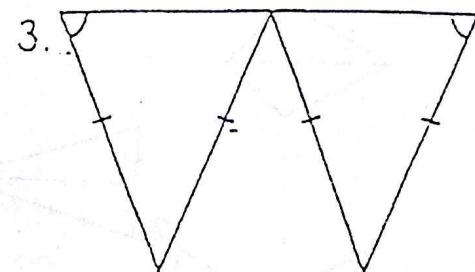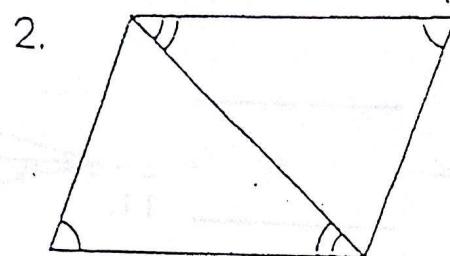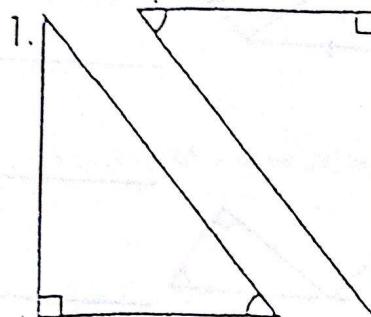
{HW 8-4}

Practice Proofs — For each of the following create a two-column proof. Be sure to use correct notation and only use postulates/theorems after you have all the necessary components needed to validate that statement.

① Given: $\overline{BC} \cong \overline{CD}$

$\overline{AC}$ bisects $\angle BCD$

Prove: $\triangle ABC \cong \triangle ADC$
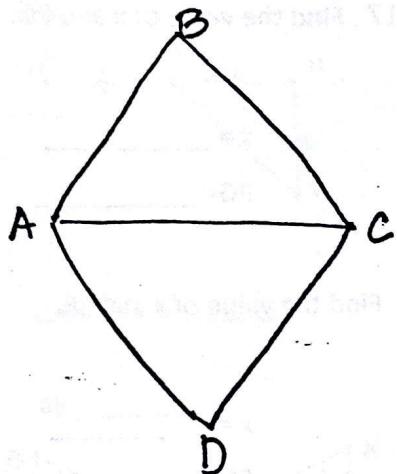


② Given: $\overline{AB} \cong \overline{ED}$

C is midpoint of $\overline{BD}$

$\overline{AB} \perp \overline{BD}$, $\overline{ED} \perp \overline{BD}$

Prove: $\triangle ABC \cong \triangle EDC$
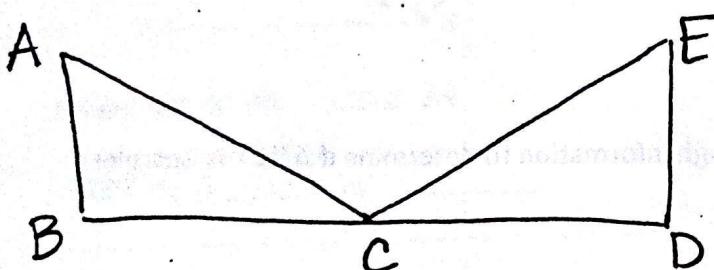
HW 8-5 Isosceles Triangle Practice _____ Name _____

## Part 1:

**1.** In triangle $ABC$, $m\angle A = x$, $m\angle B = x + 10$, and $m\angle C = 3x + 20$. Find the number of degrees in $\angle A$.
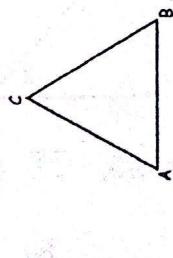
**2.** In triangle $DEF$, $m\angle E = x + 10$, $m\angle D = 3x + 30$, and $m\angle F = 5x + 50$. How many degrees are there in $\angle F$?
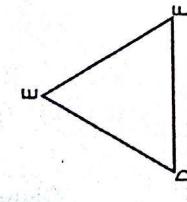
**3.** The measure of each base angle of an isosceles triangle is 20°. Find the measure of the vertex angle.
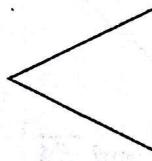
**4.** Two angles of a triangle are equal in measure and the third angle is 110°. Find the number of degrees in each of the two equal angles.

**5.** Triangle $ABC$ is an equilateral triangle. Fill in the measures of all the numbered angles.

1: _____    2: _____    3: _____

4: _____    5: _____
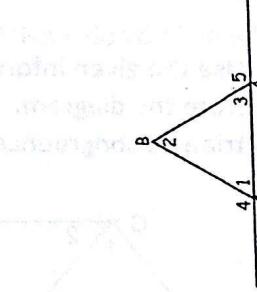
**6.** Find the measure of $\angle A$, if $\angle C$ is a right angle and $m\angle ABD = 130$:

**7.** In triangle $ABC$, $\overline{AB} \cong \overline{CB}$ and $m\angle CBD = 124$. Find the measure of $\angle A$.
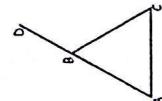
**8.** In triangle $ABC$, $m\angle BCD = 100$ and $m\angle BAC = 35$. Find the measure of $\angle B$.
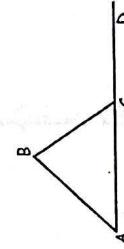
**9.** In isosceles triangle $ABC$, $\overline{AB} \cong \overline{BC}$. $m\angle C = 6x + 10$ and $m\angle ABC = 3x + 40$. Find the measure of the exterior angle $m\angle CBD$.
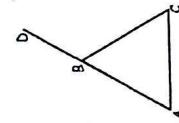
**10.** Find the value of $x$:

a.

b.

Part 2: Angle/Perpendicular Bisectors

**1.** Find FH.
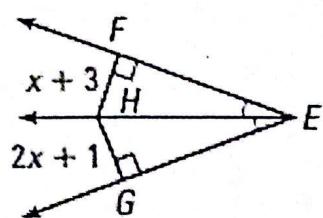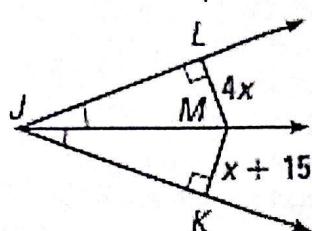
F
x + 3
H
2x + 1
G
E

**2.** Find MK.

L
4x
J
M
x + 15
K

**3.** Find EF.

E    8    H  8    G
2x + 5         x + 10
F

**14.** Find m∠JKM.

K
38°
J
L
M

**15.** Find SV.

S
V
18
U
T

**16.** Find HG.

G
14
F    J    H

**17.** Find LK.

K
x        2x − 3
L              N
M

**18.** Find PQ.

P
x + 2
S        Q
2x − 1
R

**19.** Find AD and BC.

A        D   12   C
3x + 1        2x + 6
B
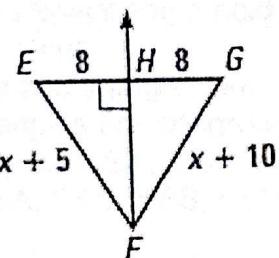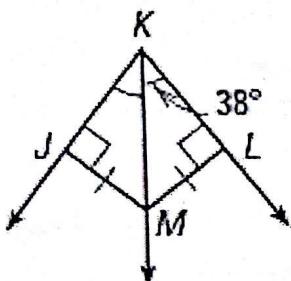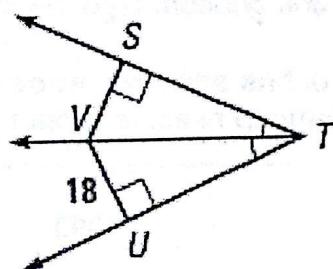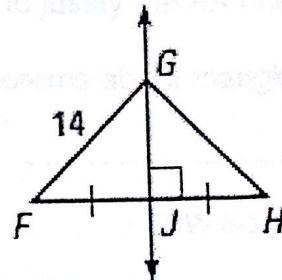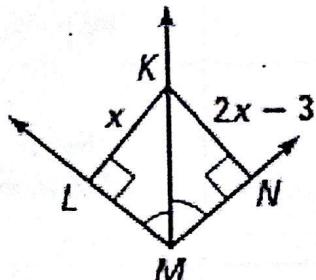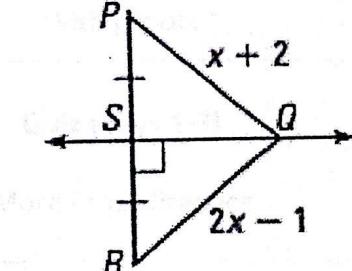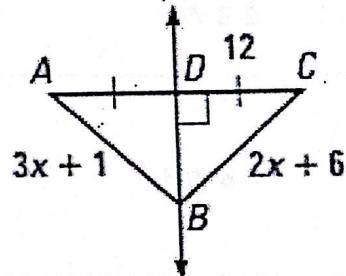
**Finish proofs from class too!!** ☺