

Lesson 4-3L: Corresponding Parts And Defn of Congruent Polygons

AGENDA:

- Homework Check & Review
- Bridge - Front Page - Discussion
- Lesson Notes

Homework:

- p 235-6 #13-18, 31
- Write out Proofs # 20,27
- Remember that CR#3 is due 11/17

What do I mean by "Write out proofs #20, 27" ?
 Draw diagrams and write all steps.

HW Answers p. 228

Find each angle measure.

19. $m\angle XYZ$ **162°**

$5x+2+8x+4=15x-18$
 $x=12$

20. $m\angle C$ **61°**

$6x-5+6x-5=11x+1$

21. $m\angle N$ and $m\angle P$ **48°; 48°**

$3y^2 = 12y^2 - 144$
 $x = 4$

22. $m\angle Q$ and $m\angle S$ **128°; 128°**

$2x^2 = 3x^2 - 64$
 $x = 8$

23. **Multi-Step** The measures of the angles of a triangle are in the ratio 1:4:7. What are the measures of the angles? (Hint: Let x , $4x$, and $7x$ represent the angle measures.) **15°; 60°; 105°**

$x+4x+7x=180$ $x=15$

Find each angle measure.

29. $\angle UXW$ **36°**

31. $\angle WZX$ **48°**

30. $\angle UWY$ **48°**

32. $\angle XYZ$ **42°**

Congruency through Transformation Exploration

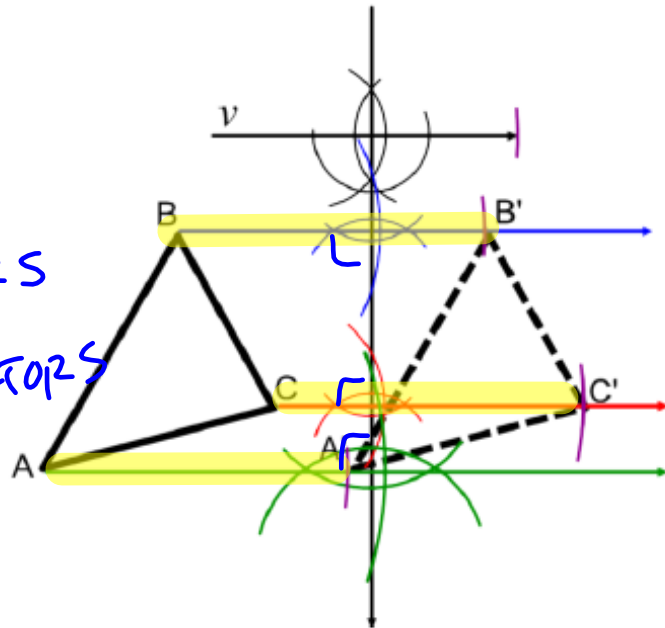
Look back to Unit 1 for help (specifically lesson 1-7)

Function Notation	
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- 1) Determine and write the transformation that mapped the pre-image $\triangle ABC$ to its image $\triangle A'B'C'$ in the table at right. Explain how you know.

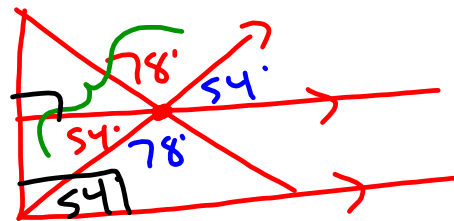
- 2) What construction steps were used in this transformation?

11 VECTORS
COPY \rightarrow \cong VECTORS



- 3) How do the construction steps justify the transformation?

29 - 36°
 30 - 48°
 31 - 48°
 32 - 42°



- 4) State the corresponding sides and angles between the pre-image and the image in the table.
- 5) Is this an isometric transformation? Explain your thinking.
- 6) Fill in the congruency statement. What did you consider as you filled it in?

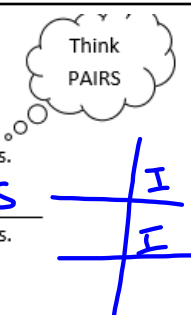
Sequence of corresponding sides (Are they congruent?)	
Sequence of corresponding angles (Are they congruent?)	
Isometry? (Yes/No)	
Congruency Statement	$\triangle ABC \cong \triangle$ _____

Geometry & Lab Unit 4-2R/4-3L: Corresponding Parts & Congruent Polygons

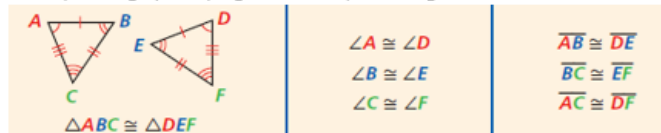
Corresponding* Sides: Sides in the SAME POSITION on two different polygons.

Corresponding* Angles: Angles in the SAME POSITION on two different polygons.

Congruent Polygons: Definition: Two polygons whose corresponding* SIDES AND \angle 'S are congruent. Note: triangles have 6 pairs of corresponding* parts.

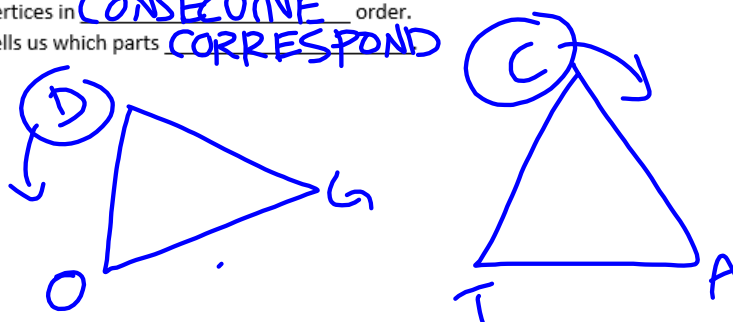


- Once you know the polygons are congruent, you can state that their corresponding* pairs (angles or sides) are congruent.



- To prove the polygons are congruent, you need to prove all the pairs of corresponding* angles AND corresponding* sides are congruent.

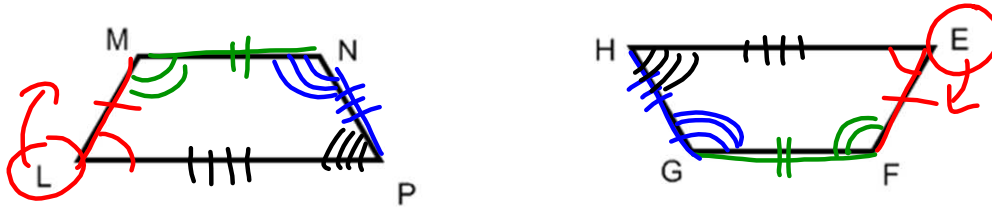
*Naming a Polygon: Write the vertices in CONSECUTIVE order. The order tells us which parts CORRESPOND.



*Naming a Polygon:

Naming Congruent Corresponding Parts

a) If polygon $LMNP \cong EFGH$, then identify all pairs of congruent corresponding parts.



$$\begin{aligned}\overline{LM} &\cong \overline{EF} \\ \overline{MN} &\cong \overline{FG} \\ \overline{NP} &\cong \overline{GH} \\ \overline{PL} &\cong \overline{HE}\end{aligned}$$

$$\begin{aligned}\angle L &\cong \angle E \\ \angle M &\cong \angle F \\ \angle N &\cong \angle G \\ \angle P &\cong \angle H\end{aligned}$$

b) If $\triangle ABC \cong \triangle DEF$, can you identify the six congruent corresponding parts without picture? How?

YES - USE NAME

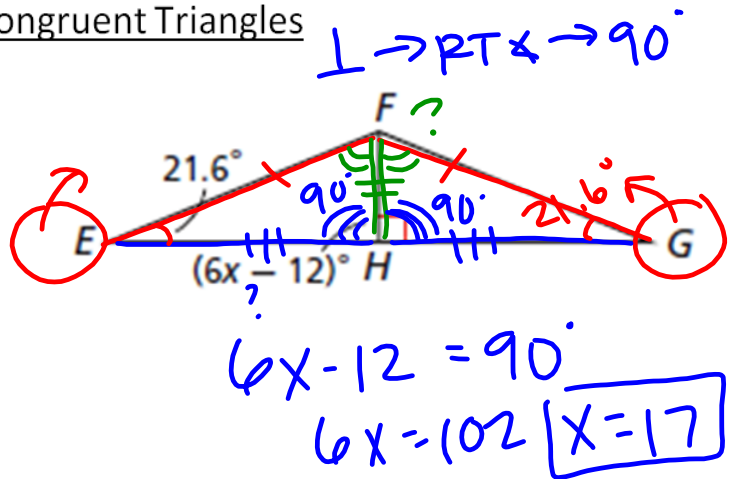
$$\angle B \cong \angle E$$

$$\overline{AB} \cong \overline{DE}$$

Using Corresponding Parts of Congruent Triangles

Given: $\triangle EFH \cong \triangle GFH$

1) Find the value of x.



2) Find $m\angle GFH$

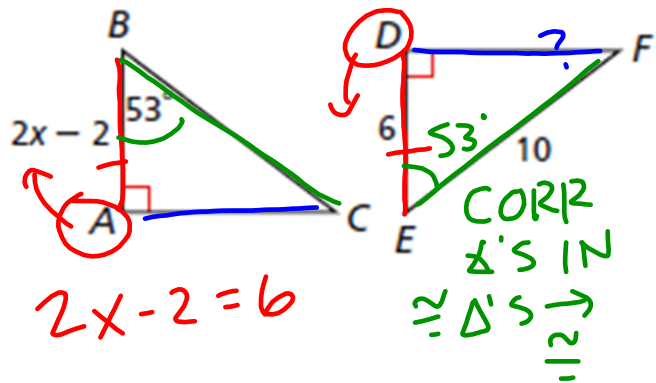
CORRESPONDING \angle 'S OF
 $\cong \Delta$ 'S ARE \cong
 $m\angle G = 21.6^\circ$

$90^\circ + 21.6^\circ + y = 180^\circ$
 $y = 68.4^\circ = m\angle GFH$

Practice:

Given: $\triangle ABC \cong \triangle DEF$

1) Find the value of x.



2) Find $m\angle F$

Δ SUM : $m\angle F = 37^\circ$

EX 1:

Given: R is the midpoint of \overline{PM} ; \overline{PRM}

$\angle P$ and $\angle M$ are right angles

$\overline{PQ} \cong \overline{MN}$, $\overline{QR} \cong \overline{NR}$

Prove: $\triangle PQR \cong \triangle MNR$

REFLECT INTO R
ROTATION OF 180° AROUND R

$\triangle PQR \cong \triangle MNR$
BY DEFN OF CONGRUENT POLYGONS

Identify the rigid motion(s) would map $\triangle PQR$ onto $\triangle MNR$.

Handwritten notes and diagrams for EX 1 include:

- Diagram of $\triangle PQR$ and $\triangle MNR$ with congruence markings.
- Diagram showing a 180-degree rotation around point R.
- Flowchart of proof steps:
 - $\triangle PQR$ and $\triangle MNR$ are right triangles (RT \triangle 's).
 - Given: $\angle P \cong \angle M$.
 - Given: $\overline{PQ} \cong \overline{MN}$.
 - Given: $\overline{QR} \cong \overline{NR}$.
 - Given: R is the midpoint of \overline{PM} .
 - Conclusion: $\triangle PQR \cong \triangle MNR$ by the definition of congruent polygons.
- Additional notes: "MIDPOINT \rightarrow 2 \cong SEG'S", "VERTICAL \triangle 'S ARE \cong ", "3RD \triangle THM".

EX 2:

Given: $\overline{JK} \perp \overline{KL}$, $\overline{ML} \perp \overline{KL}$

$\angle K LJ \cong \angle LKM$

$\overline{JK} \cong \overline{ML}$, $\overline{JL} \cong \overline{MK}$

Prove: $\triangle JKL \cong \triangle MLK$

$\triangle JKL \cong \triangle MLK$ BY DEFN OF CONGRUENT POLYGONS

Identify the rigid motion(s) would map $\triangle JKL$ onto $\triangle MLK$.

Handwritten notes and diagrams for EX 2 include:

- Diagram of $\triangle JKL$ and $\triangle MLK$ with congruence markings.
- Diagram showing a translation of \overline{JM} and a reflection into \overline{ML} .
- Flowchart of proof steps:
 - Given: $\angle K LJ \cong \angle LKM$.
 - Given: $\overline{JK} \cong \overline{ML}$.
 - Given: $\overline{JL} \cong \overline{MK}$.
 - Given: $\overline{KL} \cong \overline{LK}$.
 - Conclusion: $\triangle JKL \cong \triangle MLK$ by the definition of congruent polygons.
- Additional notes: "RT \triangle 'S \rightarrow ", "3RD \triangle THM", "REFLEXIVE GIVEN", "LINES \rightarrow RT \triangle 'S".

