



# Congruence and Triangles

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Ms. Laster

<http://dlc.k12.ar.us>



# Identifying Congruent Figures

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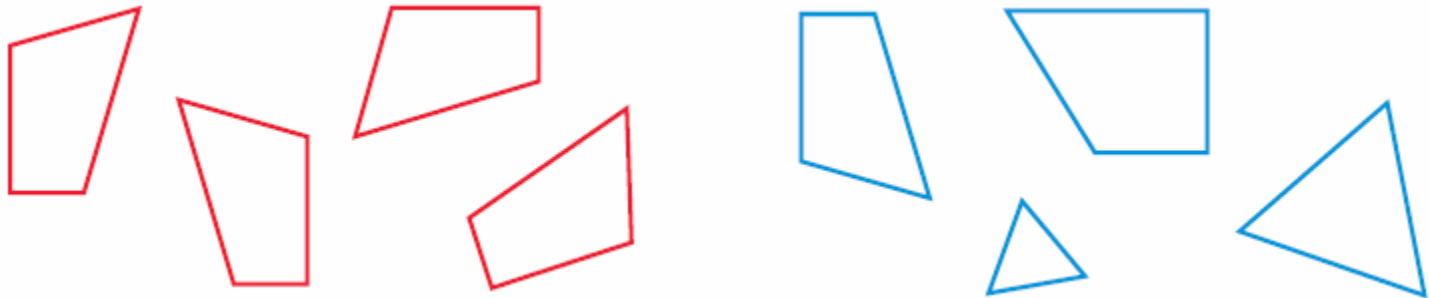
- Two geometric figures are *congruent* if they have exactly the same size and shape.



# Identifying Congruent Figures

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- Each of the red figures is congruent to the other red figures. None of the blue figures is congruent to another blue figure.





# Identifying Congruent Figures

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- When two figures are congruent, there is a correspondence between their angles and sides such that corresponding angles are congruent and corresponding sides are congruent.



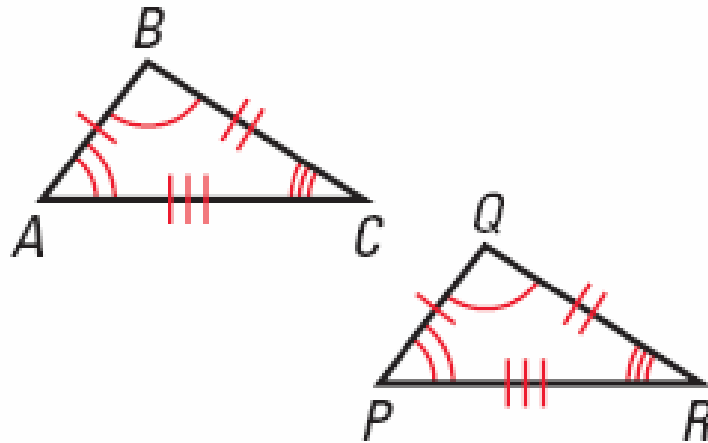
# Identifying Congruent Figures

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- When two figures are congruent, there is a correspondence between their angles and sides such that corresponding angles are congruent and corresponding sides are congruent.
- In other words, they have matching angles and matching sides.

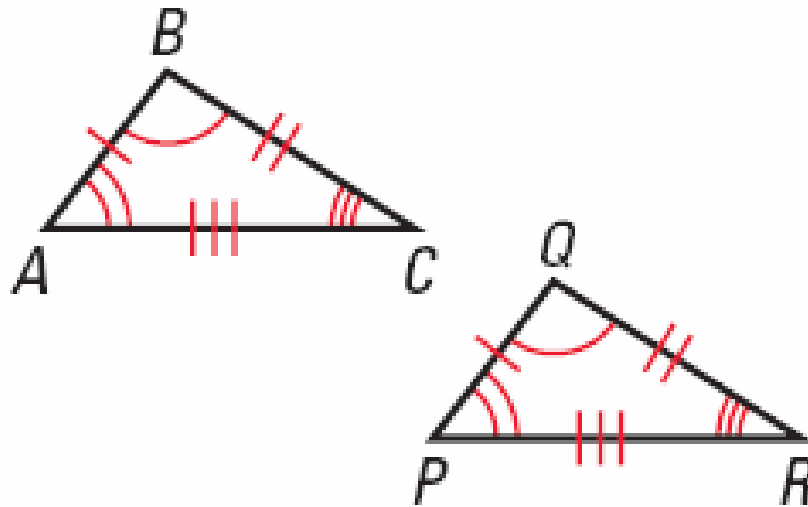
# Identifying Congruent Figures

- For the triangles below, you can write  $\triangle ABC \cong \triangle PQR$ , which is read "triangle  $ABC$  is congruent to triangle  $PQR$ ."



# Identifying Congruent Figures

- The notation shows the congruence and the correspondence, or the matching angles and sides.



# Identifying Congruent Figures

- Corresponding angles

- $\angle A \cong \angle P$

- $\angle B \cong \angle Q$

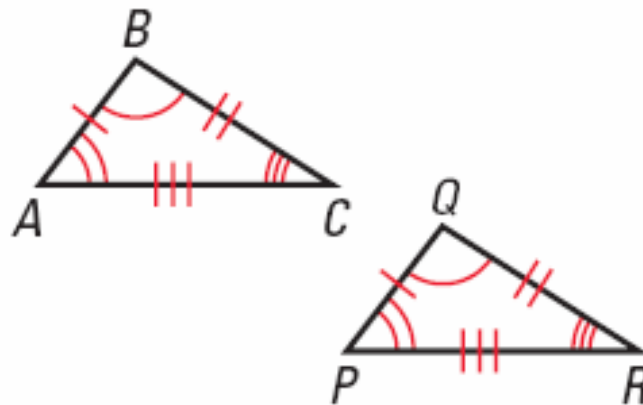
- $\angle C \cong \angle R$

- Corresponding sides

$$\overline{AB} \cong \overline{PQ}$$

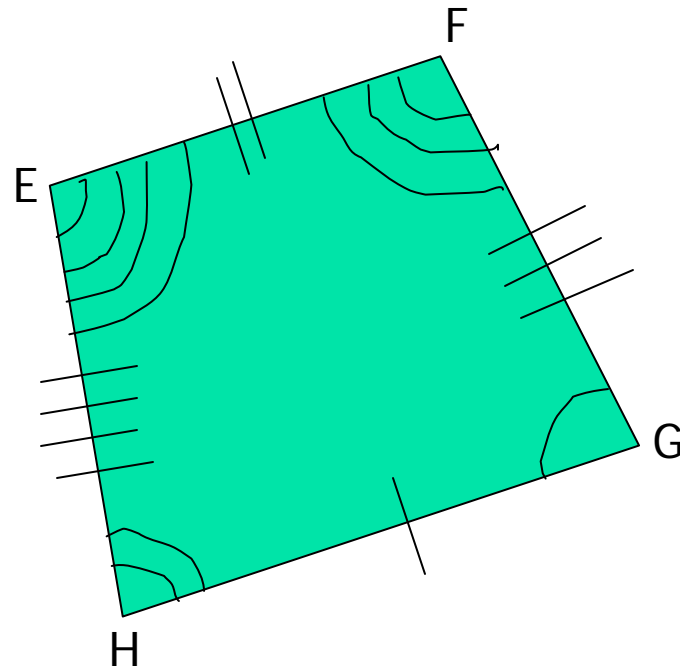
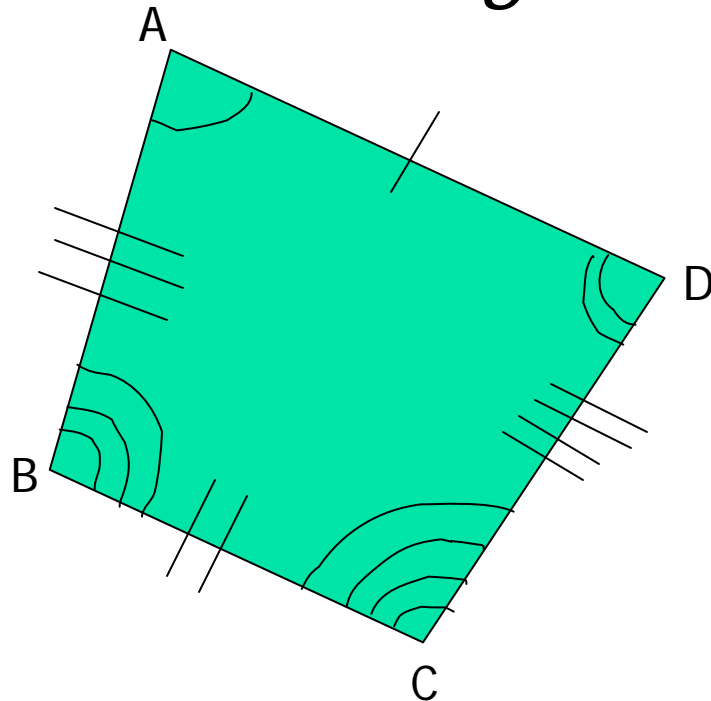
$$\overline{BC} \cong \overline{QR}$$

$$\overline{CA} \cong \overline{RP}$$



# Identifying Congruent Figures

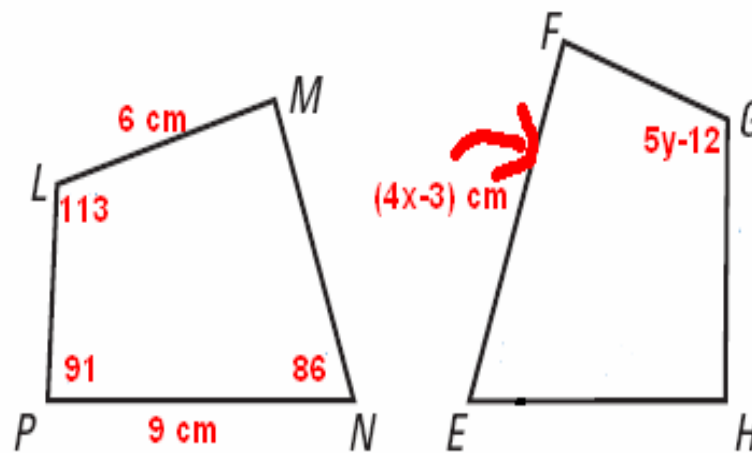
- Write a congruence statement.



# Using Properties of Congruent Figures

In the diagram,  $NPLM \cong EFGH$ .

- Find the value of  $x$ .
- Find the value of  $y$ .

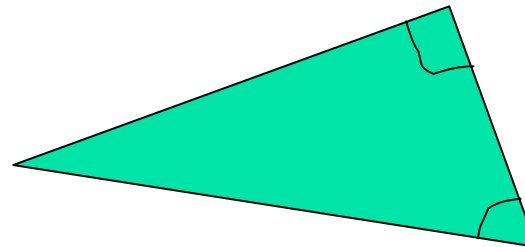
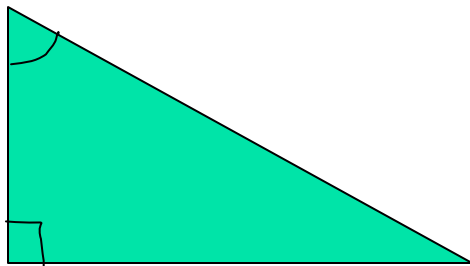




# Third Angles Theorem

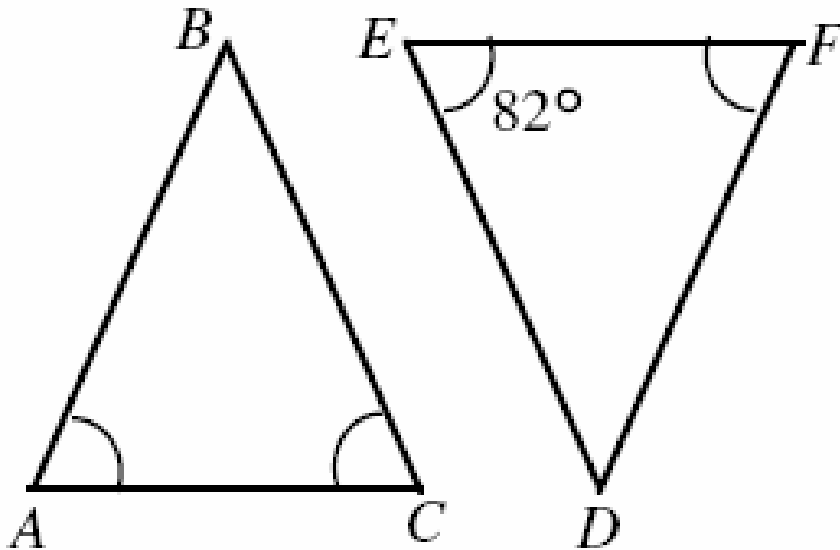
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- This theorem says that if two angles of one triangle are congruent to two angles of another triangle, then the third angles are also congruent.



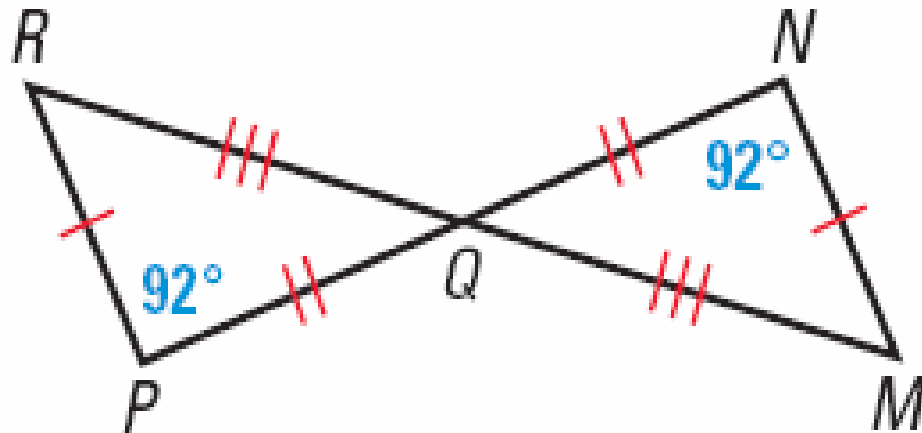
# Using the Third Angles Theorem

Find the measure of  $\angle B$ .



# Proving Triangles are Congruent

Are triangles  $RPO$  and  $MNO$  congruent?  
Why?





# Properties of Congruent Triangles

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- Reflexive:
  - Every triangle is congruent to itself.



# Properties of Congruent Triangles

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- Reflexive:
  - Every triangle is congruent to itself.
- Symmetric:
  - If  $\triangle ABC \cong \triangle DEF$ , then  $\triangle DEF \cong \triangle ABC$



# Properties of Congruent Triangles

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- Reflexive:
  - Every triangle is congruent to itself.
- Symmetric:
  - If  $\triangle ABC \cong \triangle DEF$ , then  $\triangle DEF \cong \triangle ABC$
- Transitive:
  - If  $\triangle ABC \cong \triangle DEF$ , and  $\triangle DEF \cong \triangle JKL$ , then  $\triangle ABC \cong \triangle JKL$