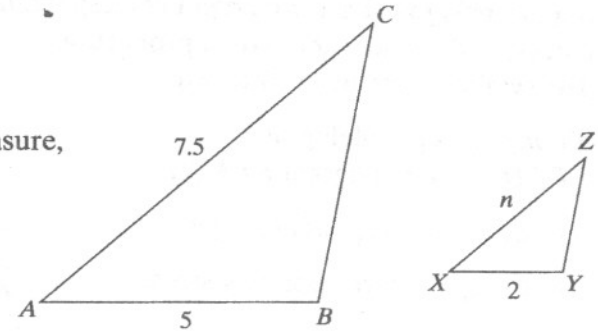
Name _____ Class _____ Date _____

Review 147

Using Similar Figures

Two polygons are **similar,** if

- corresponding angles have the same measure, and
- the lengths of corresponding sides are proportional.



$\triangle ABC \sim \triangle XYZ$

You can use proportions to find missing lengths in similar ($\sim$) figures.

① Find corresponding sides.

$\overline{AB}$ corresponds to $\overline{XY}$.
$\overline{AC}$ corresponds to $\overline{XZ}$.
$\overline{BC}$ corresponds to $\overline{YZ}$.

② Write ratios of their lengths in a proportion.

$$\frac{AB}{XY} = \frac{AC}{XZ}$$

③ Substitute the information you know.

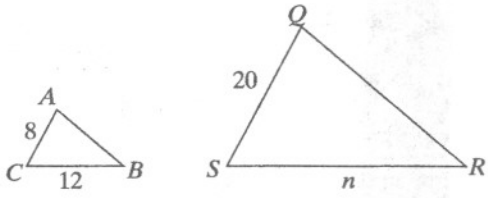
$$\frac{5}{2} = \frac{7.5}{n}$$

④ Write cross products. Solve for n.

$$5n = 2 \cdot 7.5$$
$$n = 3$$

The length of $\overline{XZ}$ is 3 units.

The figures are similar. Find the corresponding sides. Then complete the proportion and solve for *n*.



1. $\overline{AB}$ corresponds to _____.

   $\overline{BC}$ corresponds to _____.

   $\overline{CA}$ corresponds to _____.

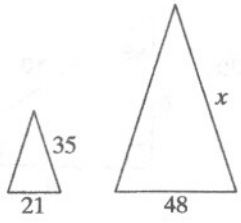
2. $\frac{CA}{SQ} = \frac{\square}{RS}$

   $\frac{8}{20} = \frac{\square}{\square}$

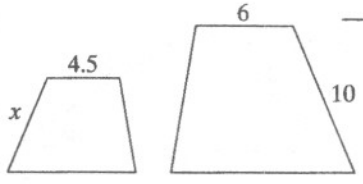
   $n =$ _____

The pairs of figures below are similar. Find the value of each variable.

3. _____



4. _____



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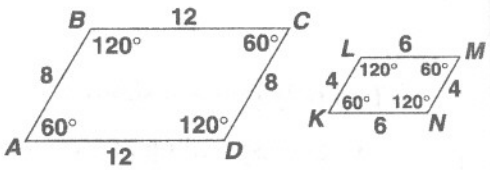
Name _____ Class _____ Date _____

Review 248

Similar polygons have congruent corresponding angles and corresponding sides that are in proportion.
The symbol ~ means *is similar to*.



Example: Is parallelogram $ABCD \sim$ parallelogram $KLMN$?

① Check corresponding angles. $\angle A \cong \angle K$, $\angle B \cong \angle L$, $\angle C \cong \angle M$, and $\angle D \cong \angle N$

② Compare corresponding sides. $\frac{AB}{KL} = \frac{8}{4} = \frac{2}{1}$ $\quad \frac{BC}{LM} = \frac{12}{6} = \frac{2}{1}$

$\frac{CD}{MN} = \frac{8}{4} = \frac{2}{1}$ $\quad \frac{DA}{NK} = \frac{12}{6} = \frac{2}{1}$

Corresponding angles are congruent. Corresponding sides are in proportion. The parallelograms are similar.

You can use proportions to find unknown lengths in similar figures.

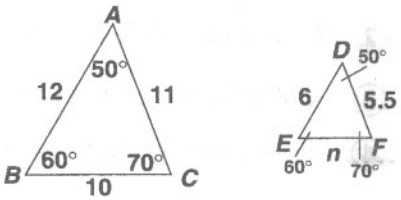
① To find EF, use a proportion. $\frac{AB}{DE} = \frac{BC}{EF}$ $\quad \triangle ABC \sim \triangle DEF$

② Substitute. $\frac{12}{6} = \frac{10}{n}$

③ Use cross products. $12n = 60$

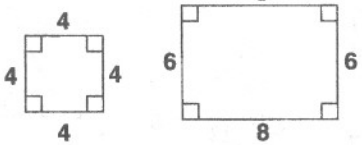
④ Solve. $n = 5$

$EF = 5$



Tell whether each pair of polygons is similar. Explain why or why not.

1.



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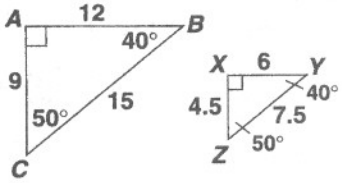

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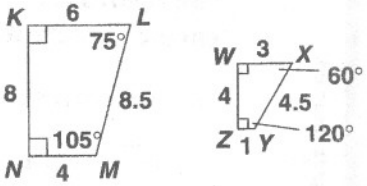
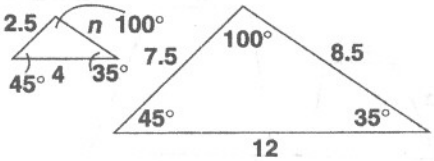


_____ _____ _____

Exercises 4–6 show pairs of similar polygons. Find the unknown length.

4.



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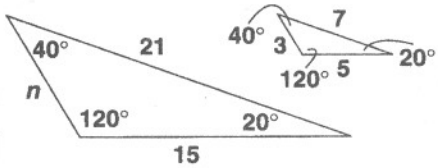
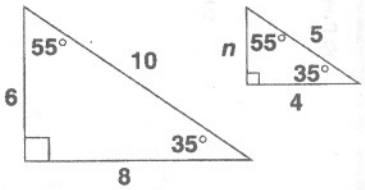


6.



_____ _____ _____

Course 3 Topics

Unit 3: Similarity, Congruence, and Transformations

Notes

Date: _____

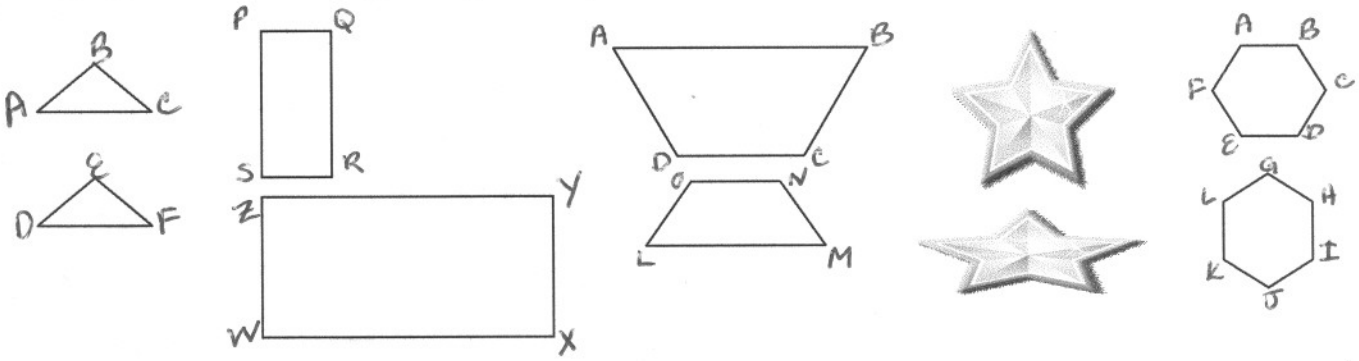
Two shapes are ***congruent*** if : _____

(symbol: ≅) _____

Two shapes are ***similar*** if : _____

(symbol: ~) _____

Classify each set as congruent, similar, or neither



_____ _____ _____ _____ _____

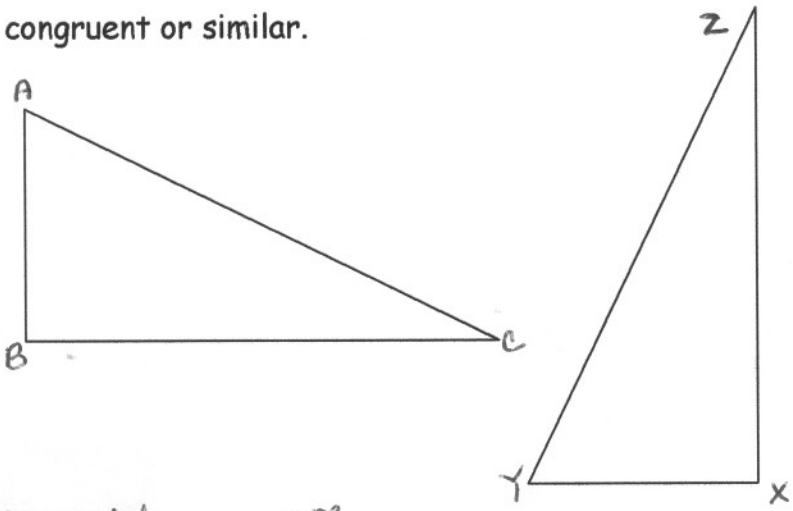
△ABC ☐ △DEF ☐POSR ☐ ☐ △ABCD ☐ △ ☐ ☐ABCDEF ☐ ☐

What is always true of similar figures? _____

What is sometimes true? _____

What is never true? _____

Example 1: Measure each length (in cm) and each angle. Determine if the two triangles are congruent or similar.



AB = _____ BC = _____ AC = _____

m∠A = _____ m∠B = _____ m∠C = _____

XY = _____ XZ = _____ YZ = _____

m∠Y = _____ m∠X _____ m∠Z = _____

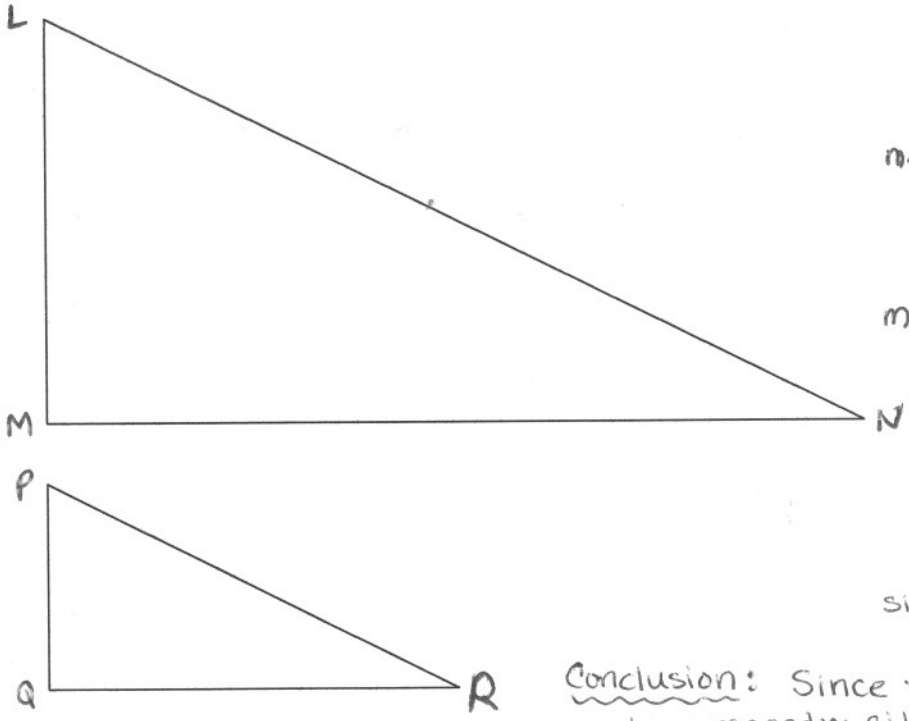
$\frac{AB}{XY}$ = _____ $\frac{BC}{XZ}$ = _____ $\frac{AC}{YZ}$ = _____

(these are the ratios of sidelengths)

△ABC and △ _____ are _____

because corresponding sides are _____ and corresponding angles are _____.

Example 2: Measure each length (in cm) and each angle. Determine if the two triangles are congruent or similar.



LM = _____ MN = _____ LN = _____

m∠L = _____ m∠M = _____ m∠N = _____

PQ = _____ QR = _____ PR = _____

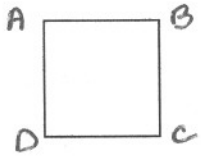
m∠P = _____ m∠Q = _____ m∠R = _____

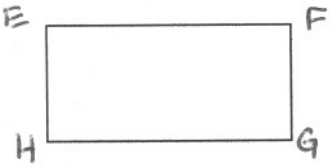
The ratios of side lengths are: $\frac{\square}{\square}$ $\frac{\square}{\square}$ $\frac{\square}{\square}$

simplified: _____ = _____ = _____

Conclusion: Since the corresponding angles are _____ and corresponding sides are _____, then ΔLMN _____ to ΔPQR. (ΔLMN ____ ΔPQR)

Example 3: Measure each length (in cm) and each angle. Determine if the two quadrilaterals are congruent or similar.





Ex. 4. On your own paper, draw a right triangle with 45° and 45° angles and two sides 8 cm each. Create a second triangle with a scale factor of 1.5 .