<name>
Class: Honors Geometry
Date: <date>
Topic: Lesson 8-2 (Similar Polygons)

Similar polygons

1. Corresponding $\angle$'s are $\cong$
2. Corresponding sides are proportional.

Symbol: ~

Example

1. $\Delta ABC \sim \Delta XYZ$ … complete each statement: $(m\angle X = 42°, m\angle Y = 78°)$

   a. $m\angle B = ?$ $\angle B$ corresponds to $\angle Y$ so $m\angle B = 78°$

   b. $\frac{BC}{YZ} = \frac{?}{XZ}$ $\overline{XZ}$ corresponds to $\overline{AC}$ so $\frac{BC}{YZ} = \frac{AC}{XZ}$

Similarity ratio

Ratios of lens of all corr. sides are equal. If $\Delta ABC \sim \Delta FED$ then $\frac{AB}{FE} = \frac{BC}{ED} = \frac{AC}{FD}$ (the corr sides are proportional)

Examples

2. **Problem #8, pg 425:** Are the polygons similar? If so, give the similarity stmt & similarity ratio. If not, explain.

   Flip *QRST* over (top-bottom) so *QT* is on the top.

   Correspondence:

   $\angle Q \cong \angle X, \angle T \cong \angle Y$ *and* $\angle S \cong \angle Z, \angle R \cong \angle W$ **(corr $\angle$'s $\cong$)**

   and $\overline{QR} \& \overline{XW}, \overline{ST} \& \overline{ZY}, \overline{QT} \& \overline{XY}, \overline{RS} \& \overline{WZ}$

   Similarity ratio: $\frac{QR}{XW} = \frac{ST}{ZY} = \frac{6}{8} = \frac{3}{4}$ or 3:4

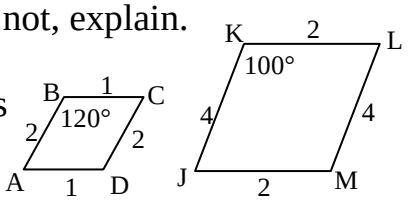
   $\frac{QT}{XY} = \frac{7.5}{10} = \frac{7\frac{1}{2}}{10} = \frac{\frac{15}{2}}{\frac{10}{1}} = \frac{15}{2} \bullet \frac{1}{10} = \frac{15}{20} = \frac{3}{4}$ or 3:4

   $\frac{RS}{WZ} = \frac{12}{16} = \frac{3}{4}$ or 3:4 **(corr sides proportional)**

   Similar: $QRST \sim XWZY$; $\frac{3}{4}$ or 3:4

3. Are the parallelograms similar? If so, give the similarity statement and similarity ratio. If not, explain.

   No; while corresponding sides are proportional (½), corr angles are not congruent.



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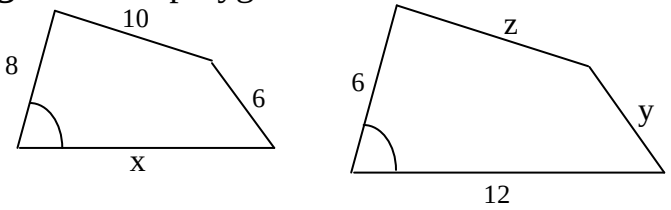
4. **Problem #15, pg 426:** The polygons are similar. Find the value of ea var.



Match corr. sides in ratios going fm the smaller polygon to the larger. **<u>Keep the order consistent!</u>**

$\frac{8}{6}=\frac{x}{12}=\frac{6}{y}=\frac{10}{z}$ (Note where the variables are)

Now solve for each variable:

$\frac{x}{12}=\frac{8}{6};x=\frac{12\bullet 8}{6}=16$ & $\frac{6}{y}=\frac{8}{6};\frac{y}{6}=\frac{6}{8};y=\frac{6\bullet 6}{8}=4.5$ &

$\frac{10}{z}=\frac{8}{6};\frac{z}{10}=\frac{6}{8};z=\frac{10\bullet 6}{8}=7.5$

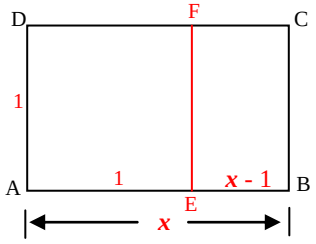
So $x = 16$; $y = 4.5$; $z = 7.5$

Golden rectangle

Rect w/len to width ratio of 1.618:1
Divides rect into square & smaller rect…sm rect ~ larger rect

Golden ratio

1.618:1 (or $\frac{l}{w}=\frac{1.618}{1}$ or $\frac{l}{w}=\frac{w}{l-w}$ or $\frac{l}{w}=\frac{l+w}{l}$)



Example

The len & width of a rectangular tabletop are in the golden ratio. The shorter side is 40 *in*. Find the length of the longer side.

Let width $w = 40$ & len be l. Form a golden ratio proportion:

$\frac{l}{w}=\frac{1.618}{1}=\frac{l}{40}$ and solve for l.

$\frac{l}{40}=\frac{1.618}{1};l=40\bullet 1.618=64.72\approx 65in$