5-7 Similar Figures and Proportions

p. 300 3-12-18

Mar 14-10:54 AM

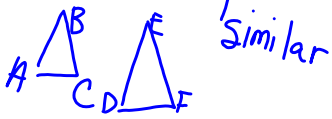
Octahedral fluorite is a crystal found in nature. It grows in the shape of an octahedron, which is a solid figure with eight triangular faces. The triangles in different-sized fluorite crystals are *similar* figures. **Similar** figures have the same shape but not necessarily the same size.

Writing Math

When naming similar figures, list the letters of the corresponding vertices in the same order. In the previous table $\Delta ABC \sim \Delta DEF$.

$\Delta ABC \sim \Delta DEF$

Similar



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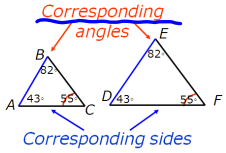
Matching sides of two or more polygons are called **corresponding sides**, and matching angles are called **corresponding angles.**



SIMILAR FIGURES

Two figures are similar if

- The measures of their corresponding angles are equal.
- The ratios of the lengths of the corresponding sides are proportional.

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Reading Math

A side of a figure can be named by its endpoints, with a bar above.

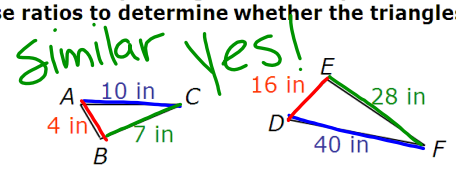
$\overline{AB}$

Without the bar, the letters indicate the *length* of the side.

Mar 14-10:58 AM

Identify the corresponding sides in the pair of triangles. Then use ratios to determine whether the triangles are similar.

Similar Yes!



$\overline{AB}$ corresponds to $\overline{DE}$. $\frac{4}{16} = \frac{1}{4}$

$\overline{BC}$ corresponds to $\overline{EF}$. $\frac{7}{28} = \frac{1}{4}$

$\overline{AC}$ corresponds to $\overline{DF}$. $\frac{10}{40} = \frac{1}{4}$

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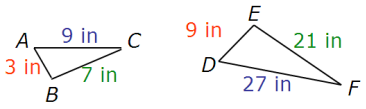
Identify the corresponding sides in the pair of triangles. Then use ratios to determine whether the triangles are similar.



$\frac{AC}{DF} = \frac{9}{27} = \frac{1}{3}$

$\frac{BC}{EF} = \frac{7}{21} = \frac{1}{3}$ Similar

$\frac{AB}{ED} = \frac{3}{9} = \frac{1}{3}$

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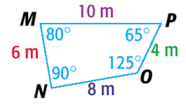
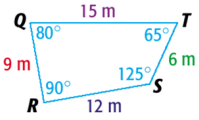
Tell whether the figures are similar.



The corresponding angles of the figures have equal measure.



Write each set of corresponding sides as a ratio.

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Determine whether the ratios of the lengths of the corresponding sides are proportional.

$\frac{MN}{QR} \stackrel{?}{=} \frac{NO}{RS} \stackrel{?}{=} \frac{OP}{ST} \stackrel{?}{=} \frac{MP}{QT}$ *Write ratios using corresponding sides.*

$\frac{6}{9} = \frac{2}{3}$ $\frac{8}{12} = \frac{2}{3}$ $\frac{10}{15} = \frac{2}{3}$

$\frac{4}{6} = \frac{2}{3}$

Similar

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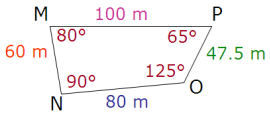
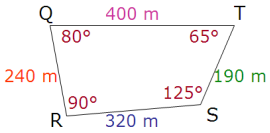
Tell whether the figures are similar.



The corresponding angles of the figures have equal measure.



Write each set of corresponding sides as a ratio.

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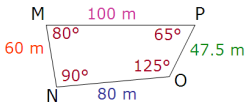
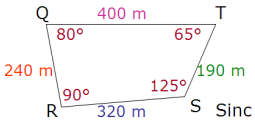
Determine whether the ratios of the lengths of the corresponding sides are proportional.





$\frac{MN}{QR} \stackrel{?}{=} \frac{NO}{RS} \stackrel{?}{=} \frac{OP}{ST} \stackrel{?}{=} \frac{MP}{QT}$

$\frac{60}{240} = \frac{1}{4}$ $\frac{47.5}{190} = .25$

$\frac{80}{320} = \frac{1}{4}$ .25

Sinc

Similar $\frac{100}{400} = \frac{1}{4}$

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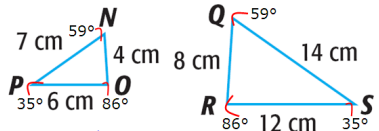
Tell whether the figures are similar.

1.



$\frac{4}{8} = \frac{1}{2}$ $\frac{7}{14} = \frac{1}{2}$

Similar $\frac{6}{12} = \frac{1}{2}$

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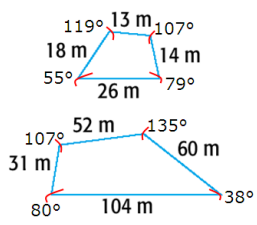
Tell whether the figures are similar.

2.



not similar

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