CCGPS Analytic Geometry
Similarity

Similarity Notes # 2

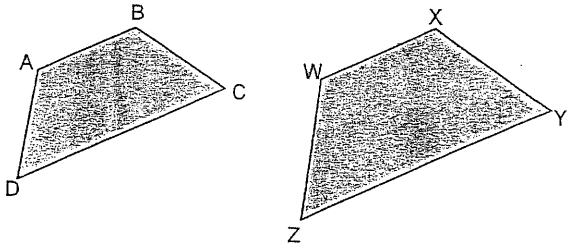
Name: _____

Similar Polygons

Two polygons are _____ (~) if their vertices can be matches so that:

- Corresponding _____ are _____.
- Ratios of lengths of corresponding _____ are _____.

If ABCD ~ WXYZ, then:



1. $\angle A \cong \angle W,\ \angle B \cong \angle X,\ \angle C \cong \angle Y,\ and\ \angle D \cong \angle Z$
2. $\frac{WX}{AB} = \frac{XY}{BC} = \frac{YZ}{CD} = \frac{WZ}{AD}$

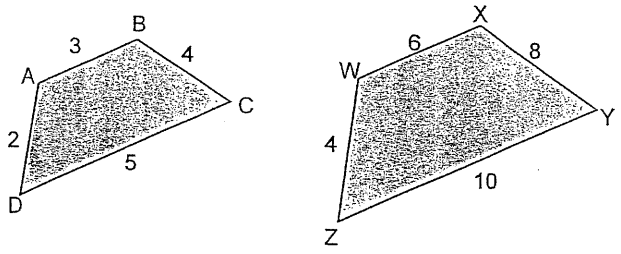
Conversely, if parts 1 & 2 are true, then you can conclude that ABCD ~ WXYZ.

The _____ of two similar polygons is the ratio that will transform the first polygon to the second.

To find the scale factor between two figures, write a ratio using the length of one of the sides of the transformed figure (the second figure) over the length of the corresponding sides of the original figure.

Example # 1:

ABCD ~ WXYZ.
Find the scale factor that will transform the first figure to the second figure.



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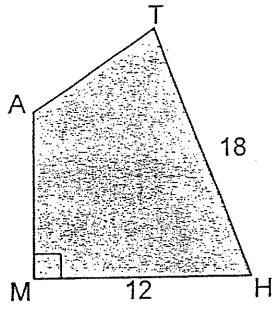
Example # 2: MATH ~ KIDS

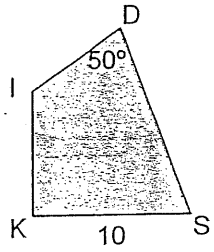


(a) $\angle A \cong$ _____

(b) $m\angle K =$ _____

(c) $m\angle T =$ _____

(d) $\frac{ID}{AT} = \frac{IK}{?}$ $?=$ _____

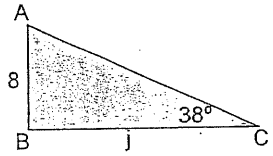


(e) *Scale factor* = _____

(f) $DS =$ _____

Now you try!

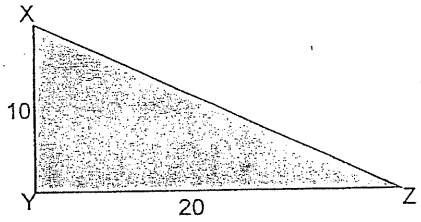
3. ABC ~ XYZ



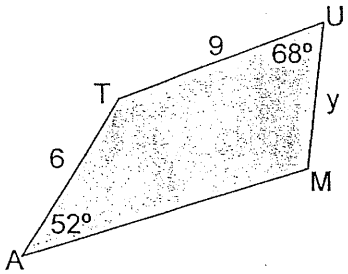
(a) Scale factor = _____

(b) j = _____

(c) $m\angle Z =$ _____



4. Quad. TAMU ~ Quad. T'A'M'U'

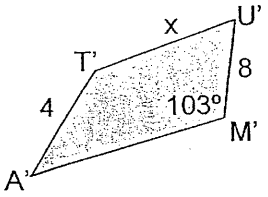


(a) Scale factor = _____

(b) x = _____

(c) y = _____

(d) $m\angle U' =$ _____



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Similarity Notes # 2 Name: _____

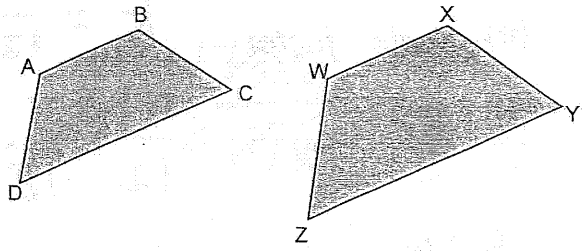
Similar Polygons

Two polygons are similar **(~) if their vertices can be matches so that:**

- Corresponding angles are congruent.
- Ratios of lengths of corresponding lengths are proportional.

If ABCD ~ WXYZ, then:

1. $\angle A \cong \angle W,\ \angle B \cong \angle X,\ \angle C \cong \angle Y,\ and\ \angle D \cong \angle Z$
2. $\frac{WX}{AB} = \frac{XY}{BC} = \frac{YZ}{CD} = \frac{WZ}{AD}$



Conversely, if parts 1 & 2 are true, then you can conclude that ABCD ~ WXYZ.

The scale factor **of two similar polygons is the ratio that will transform the first polygon to the second.**

To find the scale factor between two figures, write a ratio using the length of one of the sides of the transformed figure (the second figure) over the length of the corresponding sides of the original figure.

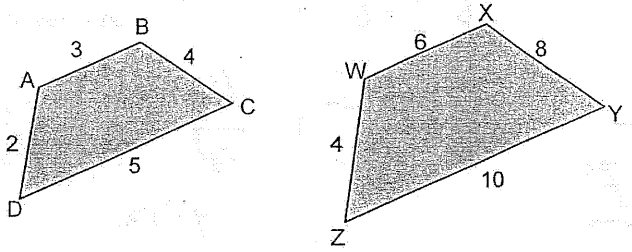
$k = \frac{\text{transformed}}{\text{original}}$

original transformed

Example # 1:

ABCD ~ WXYZ.

Find the scale factor that will transform the first figure to the second figure.



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

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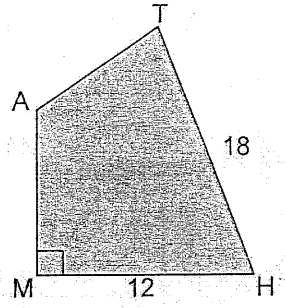
original transformed

Example # 2: MATH ~ KIDS



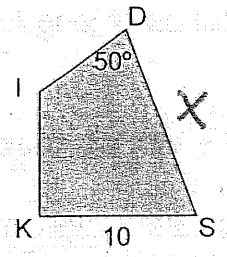
(a) $\angle A \cong$ $\angle I$

(b) $m\angle K =$ $\angle M = 90°$

(c) $m\angle T =$ $50°$

(d) $\frac{ID}{AT} = \frac{IK}{?}$ $? =$ AM

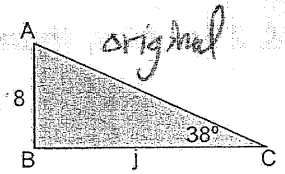
(e) *Scale factor* = $k = \frac{10}{12} = \frac{5}{6}$



(f) $DS =$ $\frac{10}{12} = \frac{x}{18}$ $\frac{12x}{12} = \frac{180}{12}$ $x = 15$

Now you try!

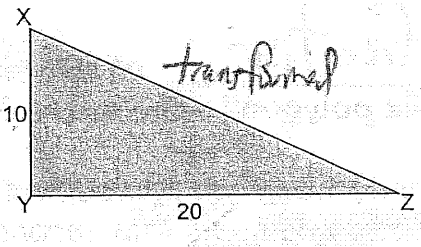
3. ABC ~ XYZ



(a) Scale factor = $k = \frac{10}{8} = \frac{5}{4}$

(b) j = 16

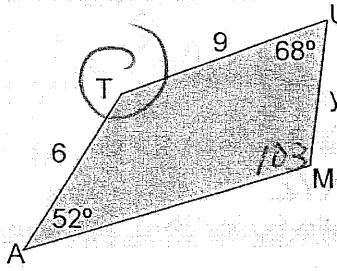
(c) $m\angle Z =$ $38°$



$\frac{5}{4} = \frac{20}{j}$ $\frac{5j}{5} = \frac{80}{5}$

360
− 68
52
−103

4. Quad. TAMU ~ Quad. T'A'M'U'

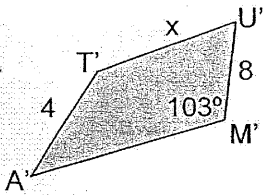


(a) Scale factor = $k = \frac{4}{6} = \frac{2}{3}$

(b) x = 6 $\frac{4}{6} = \frac{x}{9}$ $\frac{6x}{6} = \frac{36}{6}$

(c) y = 12 $\frac{4}{6} = \frac{8}{y}$ $\frac{4y}{4} = \frac{48}{4}$ $y = 12$

(d) $m\angle U' =$ 68



e) $m\angle T =$ $137°$