Day 6: Review of Transformations; Review of Ratios and Proportions

Warm-Up/Some Review for the quiz:

Given the points C (3, 2), A (-5, 4), and T (-1, 6), name the new points after the following transformations. Then, describe the transformation.

1.) $(X,Y)\rightarrow(-X,-Y)$ C'(-3, 2), A'(5, 4) T'(1, 6) R y-axis

2.) $(X,Y)\rightarrow(Y,X)$ C'(2, 3), A'(4, -5), T'(6, -1) R y=x

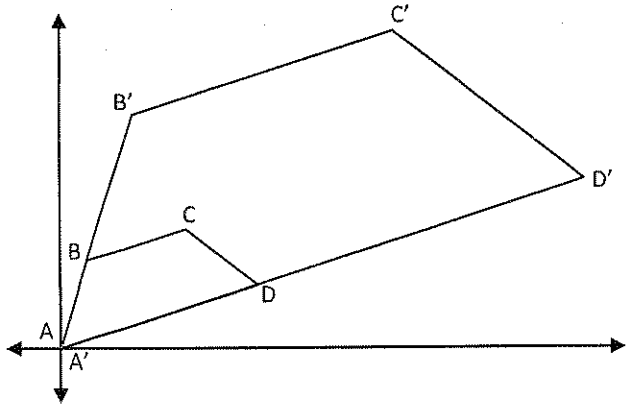
3.) $(X,Y)\rightarrow(X-3,Y+1)$ C'(0, 3), A'(-8, 5), T'(-4, 7) Translation left 3 and up 1

4.) $(X,Y)\rightarrow\left(\frac{1}{2}X,\frac{1}{2}Y\right)$ $C'\left(\frac{3}{2}x, y\right)$, $A'\left(\frac{-5}{2}x, 2y\right)$, $T'\left(-\frac{1}{2}x, 3y\right)$ Dilation reduction by $\frac{1}{2}$

Similarity

Discovery: Let's find out how Similarity works!!

Quadrilateral ABCD has been dilated about the origin by a magnitude of $\frac{5}{2}$ to obtain Quadrilateral A'B'C'D'.



Use the information provided to answer each of the questions below.

1. If the measures of $\angle ABC$ and $\angle C$ are $120°$, and the measures of $\angle A$ and $\angle ADC$ are $60°$, what is the measure of $\angle C'$? What is the measure of $\angle A'$?
   120° 60°
2. What is the ratio of $CD:C'D'$? What is the ratio of $A'B':AB$?
   2:5 5:2
3. If AD is 8 in, what is the length of $A'D'$?
   20 in.
4. If $B'C'$ is 15 in, what is the length of BC?
   6 in.
5. Name the segments that are parallel to each other. How can you be sure?
   $\overline{BC}$ & $\overline{B'C'}$; $\overline{CD}$ & $\overline{C'D'}$ A dilation takes a line not passing through the center of dilation to a parallel line
6. If the slope of $\overline{AB}$ is $\frac{1}{3}$, what is the slope of $\overline{A'B'}$? How do you know this?
   $\frac{4}{3}$ $\overline{AB}$ & $\overline{A'B'}$ are on the same line since they pass through the center of dilation.

Summary:

Two figures are similar (~) if they have the same shape but not necessarily the same size.

The scale factor is the ratio of the lengths of the corresponding sides.

(a.k.a. the similarity ratio)

Two figures are congruent (≅) if they are similar and the same size.

Two polygons are similar if:

1) Corresponding angles are congruent AND 2) Corresponding sides are proportional

Two TRIANGLES are similar if ~

1st way: AA ~ (2 ∠ pairs ≅)

2nd way: SAS ~ (2 sides proportional and ∠'s ≅ between those 2 sides)

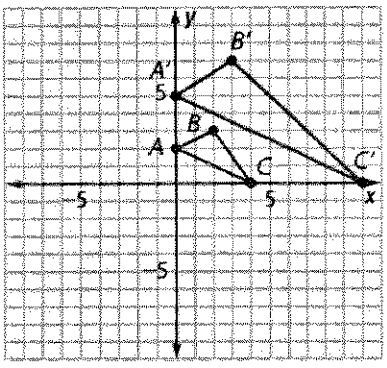
3rd way: SSS ~ (3 sides proportional)

Day 7: Similarity

Warm-Up: Given triangle CDE with C(2, 2), D(-6, 4), and E(-2, -6), write the points of the image under the following transformations.

1) $(x, y) \rightarrow (3x, 3y)$
2) $(x, y) \rightarrow (\frac{1}{4}x, \frac{1}{4}y)$
3) Dilation with scale factor 2
4) Horizontal stretch with scale factor 1/3, vertical shrink with scale factor 1/3
5) 21st Century Skill Check :

Triangle ABC and Triangle A'B'C' are shown on the right. The scale on each axis is 1.



Since Triangle A'B'C' is bigger than triangle ABC, Logan thinks that triangle A'B'C' can be obtained by applying a size transformation centered at the origin to triangle ABC. Do you agree or disagree with Logan? Explain your reasoning.