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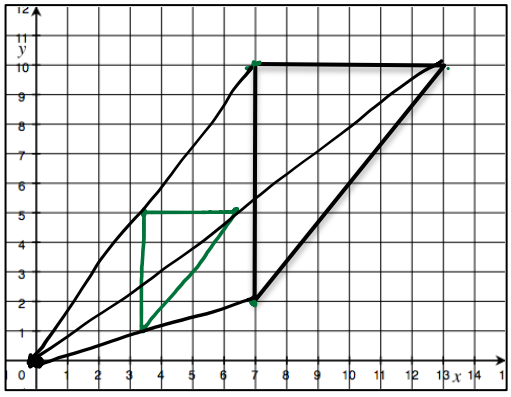
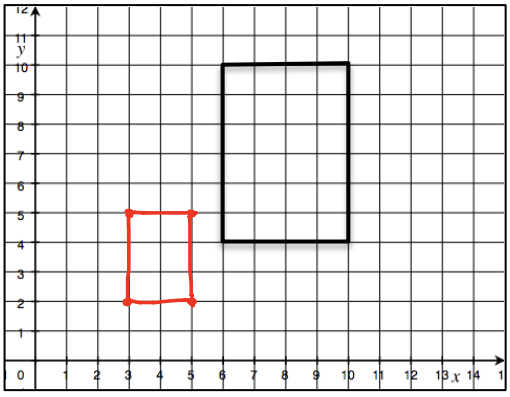
Learning Objective: We will prove two geometric figures are similar by using dilations AND rigid motions. (G8M3L7)

Activating Prior Knowledge:

We know how to show two objects are similar by a dilation at a center O.
Dilate each geometric shape from the origin using a scale factor of 1/2 .

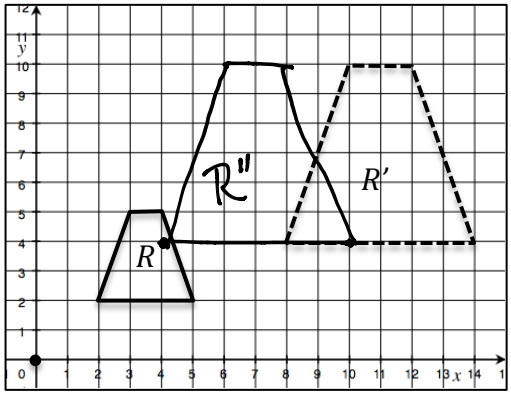




Concept Development:

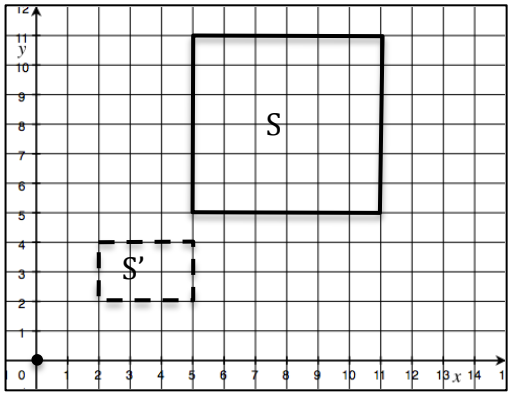
A dilation alone might NOT be enough to determine similarity. Sometimes, we will need to perform a dilation AND a rigid motion.

Example:



The solid shape is similar to the dashed shape by performing a dilation from the origin with a scale factor of 2 and translating 4 units to the right.

Non-Example:



The two shapes are not similar because there is not a sequence of a dilation and a rigid motion that can map S onto S'

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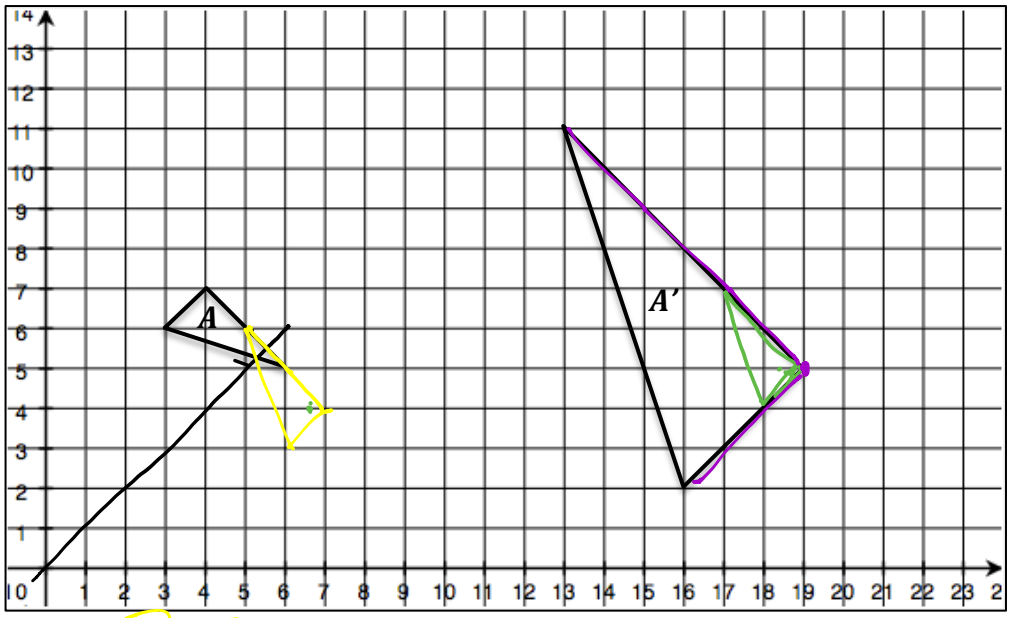
Similarity is symmetric. This means that if $A \sim A'$, then $A' \sim A$.

Example:

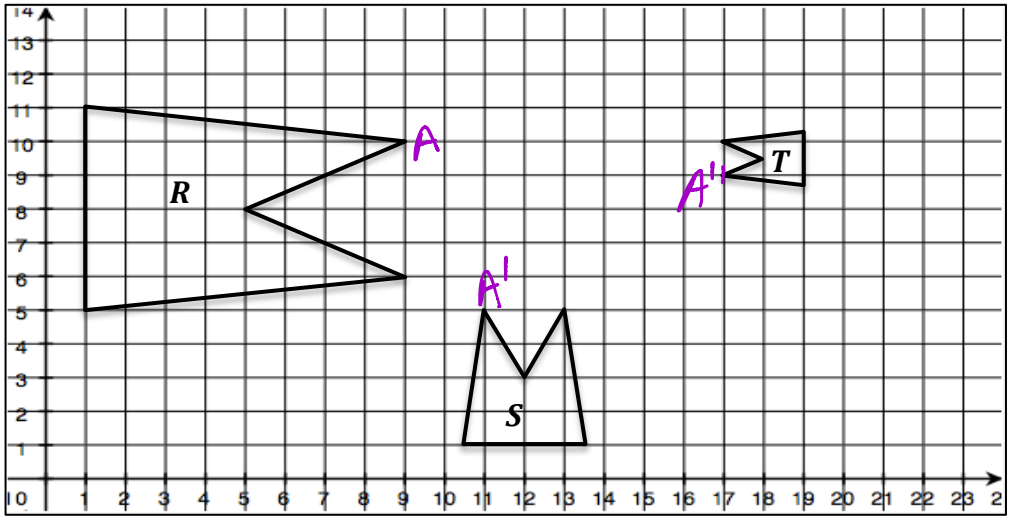
"is similar to"



Reflect $y=x$ $T\langle 12,1\rangle$ Dilate from (9,5), r=3

Similarity is transitive. This means that if $R \sim S$ and $S \sim T$, then $R \sim T$.

Example:



R→S Rotation, dilation

S→T Rotation, dilation

R→T Rotation or reflection, dilation

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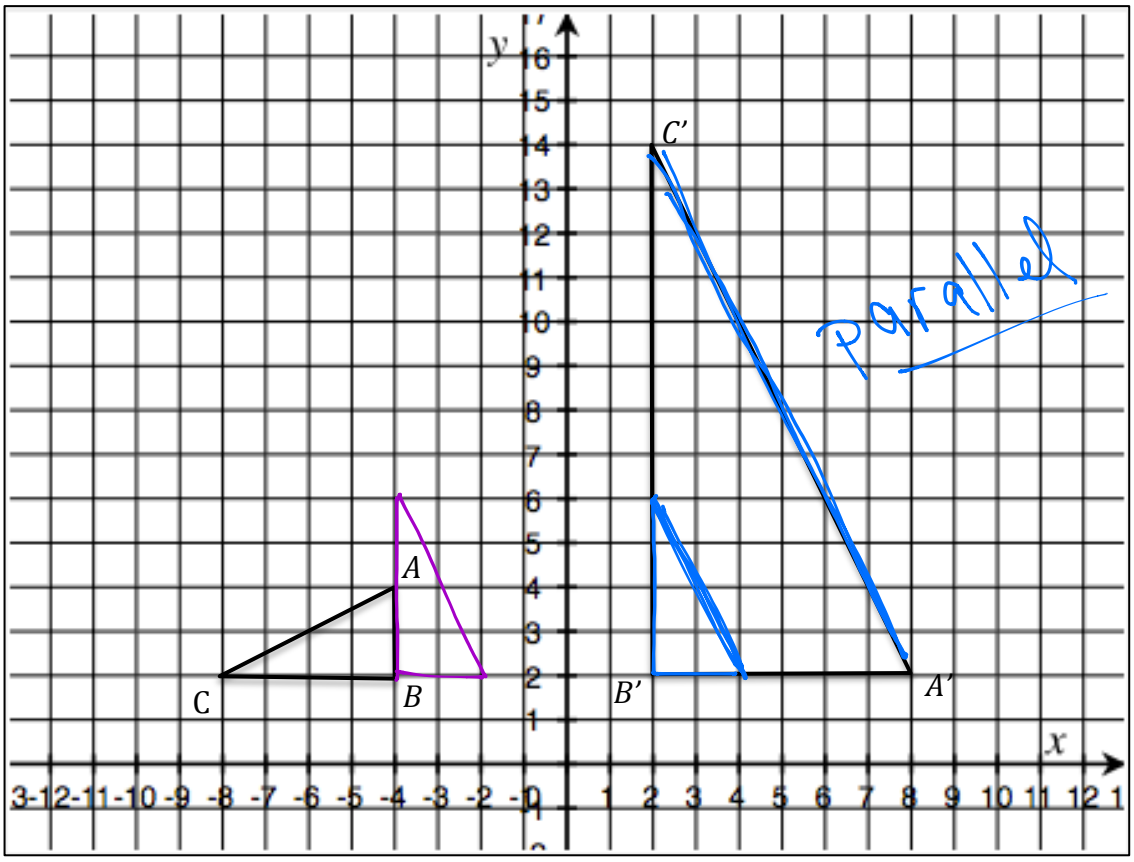
Guided Practice:

Steps for Describing Similarity that Exists between Geometric Figures

1. Dilate the original shape from a center (if possible, let it be the origin). Choose a scale factor that will cause the dilated shape to be the same size as the shape you're trying to show similarity with.
2. Perform the necessary rigid motions to map one figure onto another, showing similarity.



Rotate 90° clockwise on point B. (-4,2)

T (6,0)

Dilate from (2,2) r=3

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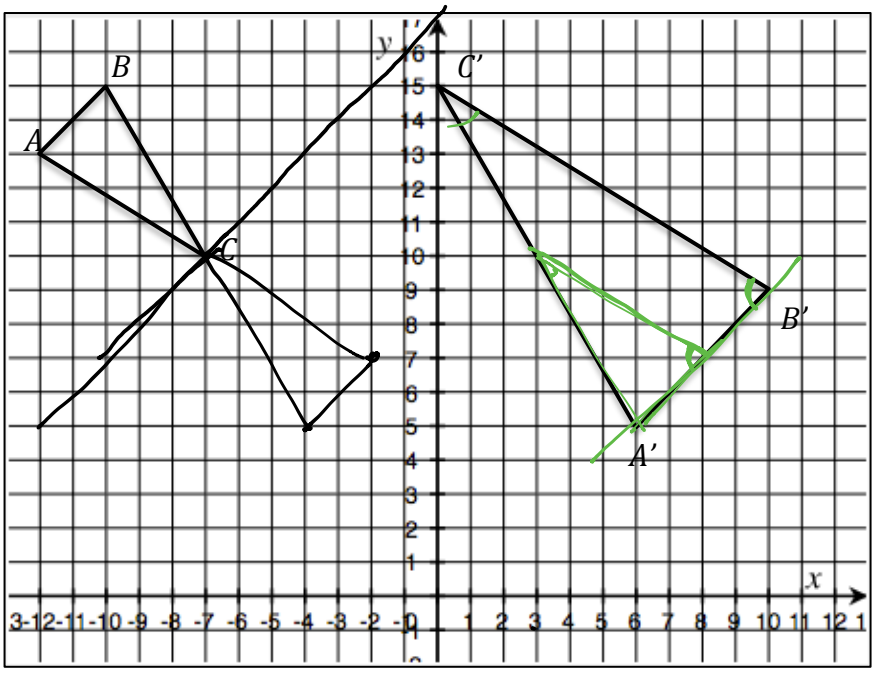
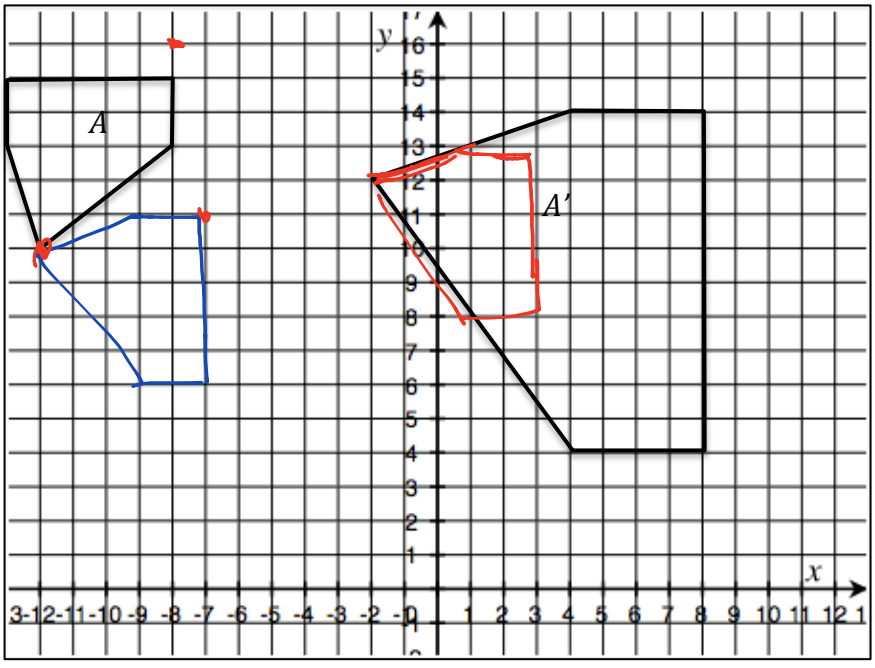


Reflect $y = x + 17$

$T_{(10,0)}$

Dilate from (6,5)

$r = 2$



Rotate 90° clockwise around (-12,10)

$T_{(10,2)}$

Dilate (-2,12) $r = 2$

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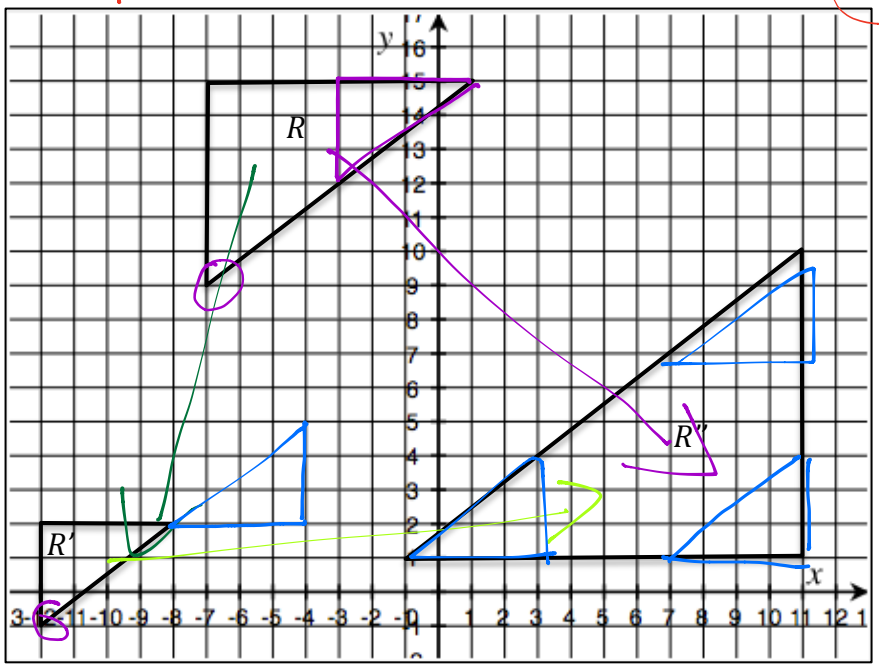
Is $R \sim R''$? ① Prove $R \sim R'$ ② Prove $R' \sim R''$

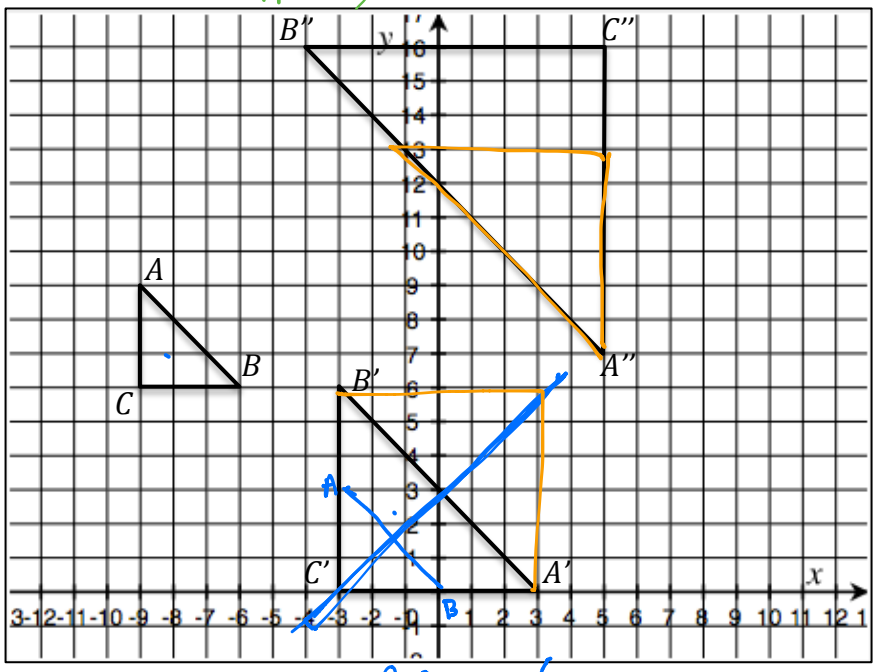


Dilate R $r = \frac{1}{2}$ from (1,15)

$T_{(-9,-13)}$

180° Rotation (-8,2)

$T_{(5,-11)}$, Dilate from (11,1) $r = 3$



Translate (6,-6)

Dilate (-3,6) $r = 2$

Reflect $y = x + 3$

$y = -x + 3$

$T_{(2,7)}$ Dilate (5,7) $r = \frac{3}{2}$

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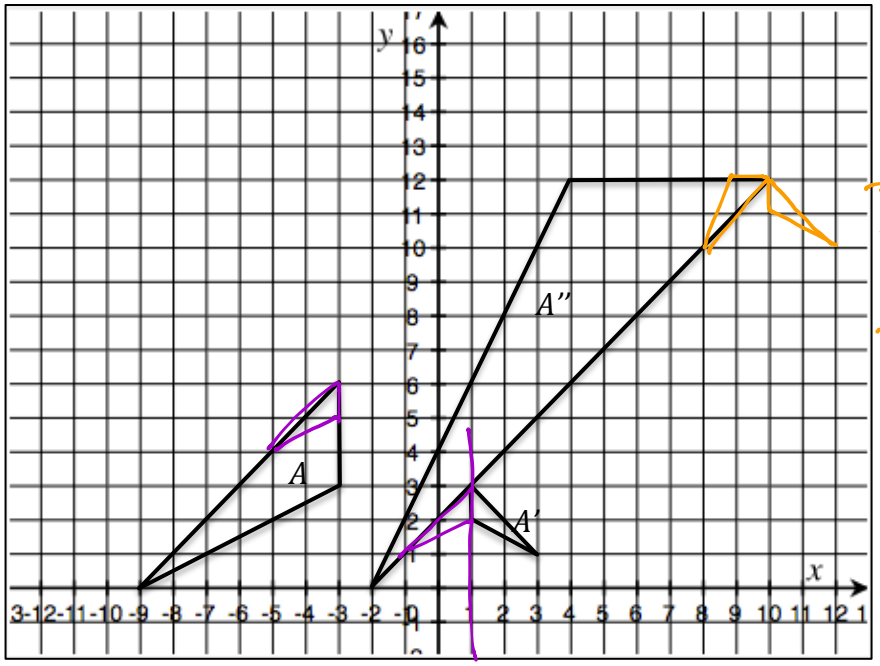
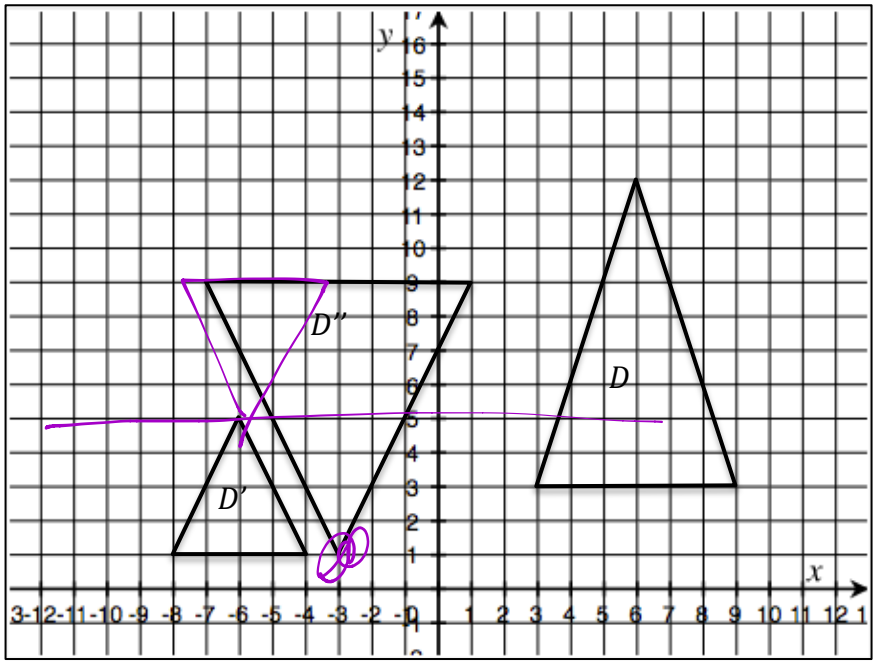


Rot 90° CW
(10, 12)
Dilate
r = 6
From (11, 12)



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Closure:

Is a dilation alone always enough to prove that two figures are similar? Explain.

Teacher Notes:

Last one is not similar, but all the others are.