SIMILARITY & RIGHT TRIANGLE TRIGONOMETRY – 6.2

6. 2 Triangle Dilations

A Solidify Understanding Task

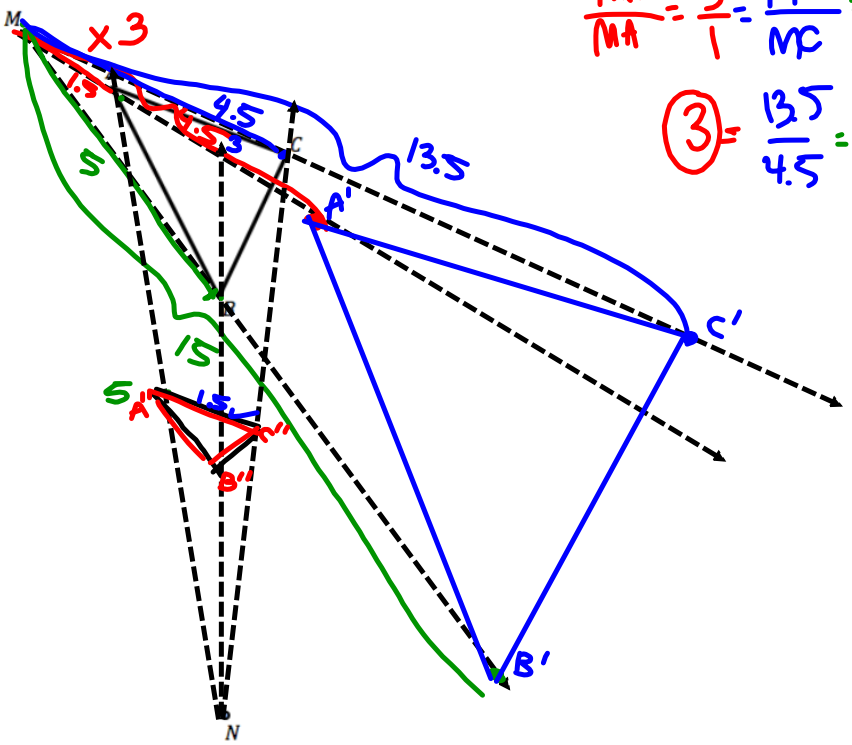
Get a Ruler, start 6.2 lesson

1. Given ΔABC, use point M as the center of a dilation to locate the vertices of a triangle that has side lengths that are three times longer than the sides of ΔABC.

2. Now use point N as the center of a dilation to locate the vertices of a triangle that has side lengths that are one-half the length of the sides of ΔABC.

$\frac{MA'}{MA} = \frac{3}{1} = \frac{MC'}{MC} = \frac{MB'}{MB} = \frac{B'C'}{BC}$

$3 = \frac{13.5}{4.5} = \frac{15}{5}$



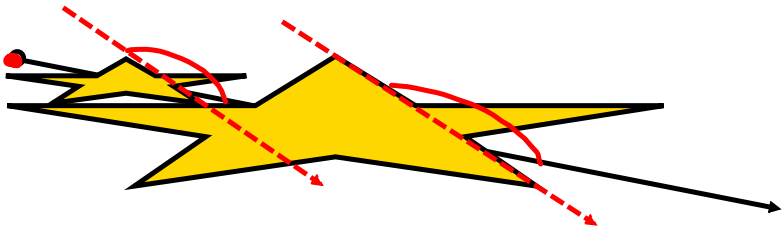
3. Label the vertices in the two triangles you created in the diagram above. Based on this diagram, write several proportionality statements you believe are true. First write your proportionality statements using the names of the sides of the triangles in your ratios. Then verify that the proportions are true by replacing the side names with their measurements, measured to the nearest millimeter.

My list of proportions: (try to find at least 10 proportionality statements you believe are true)

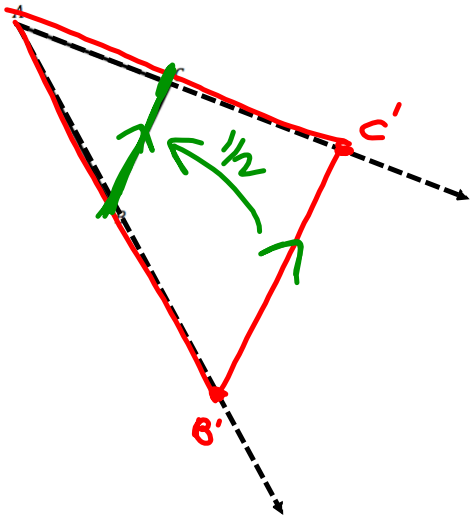
4. Based on your work above, under what conditions are the corresponding line segments in an image and its pre-image parallel after a dilation? That is, which word best completes this statement?

After a dilation, corresponding line segments in an image and its pre-image are [never, sometimes, always] parallel.

5. Give reasons for your answer. If you choose "sometimes", be very clear in your explanation about how you can to tell when the corresponding line segments before and after the dilation are parallel and when they are not.



Given ΔABC, use point A as the center of a dilation to locate the vertices of a triangle that has side lengths that are twice as long as the sides of ΔABC.



6. Explain how the diagram you created above can be used to prove the following theorem:

The segment joining midpoints of two sides of a triangle is parallel to the third side and half the length.

BC B'C'

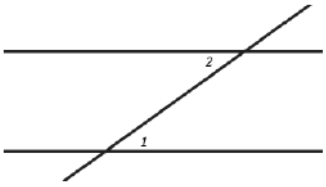
$\frac{AC}{AC'} = \frac{1}{2} = \frac{BC}{B'C'}$ = always ×2 bigger or reverse 1/2 smaller

READY

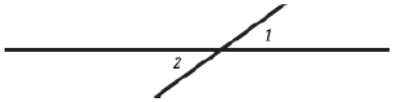
Topic: Basic angle relationships

Match the diagrams below with the best name or phrase that describes the angles.

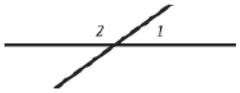
_____1.



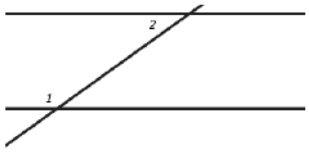
_____2.



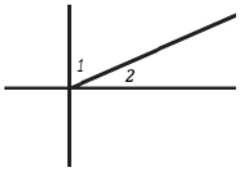
_____3.



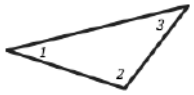
_____4.



_____5.



_____6.



a. Alternate Interior Angles b. Vertical Angles c. Complementary Angles

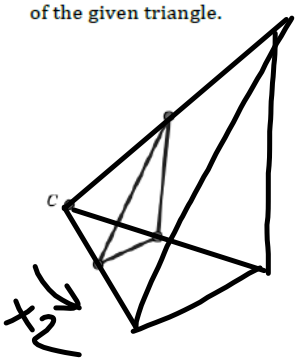
d. Triangle Sum Theorem e. Linear Pair f. Same Side Interior Angles

SET

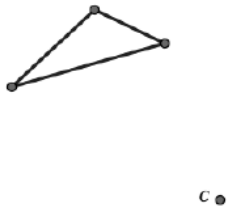
Topic: Performing mathematical dilations and finding the center of dilations.

Use the given pre-image and point *C* as the center of dilation to perform the dilation that is indicated below.

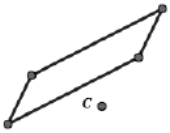
7. Create an image with side lengths twice the size of the given triangle.



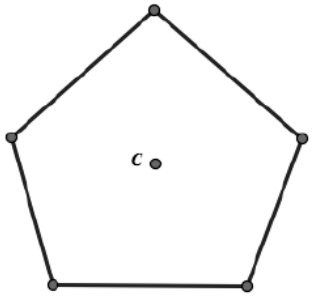
8. Create an image with side lengths half the size of the given triangle.



9. Create an image with side lengths three times the size of the given parallelogram.

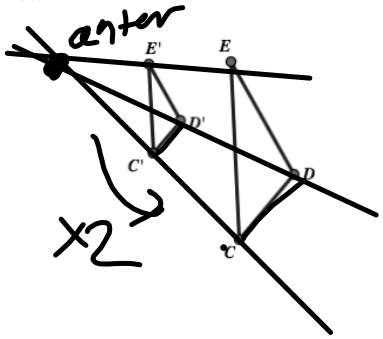


10. Create an image with side length one fourth the size of the given pentagon.

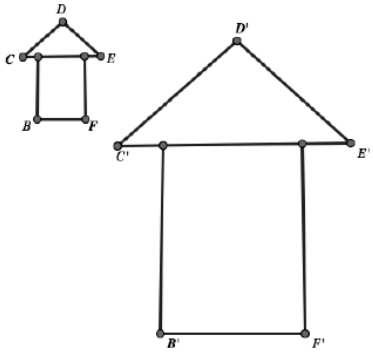


Use the given pre-image and image in each diagram to define the dilation that occurred. Include as many details as possible such as the center of the dilation and the ratio.

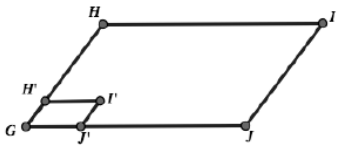
11.



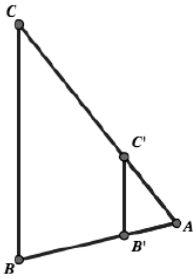
12.



13.



14.



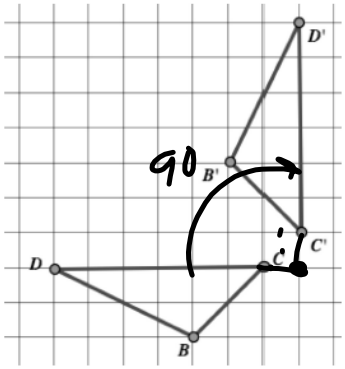
GO

Topic: Classifying mathematical transformations.

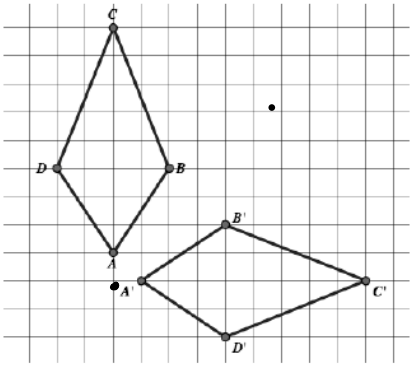
Based on the given image and pre-image determine the transformation that occurred. Further, prove that the transformation occurred by showing evidence of some kind.

(*For example, if the transformation was a reflection show the line of reflection exists and prove that it is the perpendicular bisector of all segments that connect corresponding points from the image and pre-image. Do likewise for rotations, translations and dilations.*)

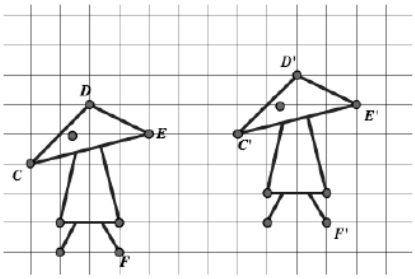
15.



16.



17.



18.