Module 7c: Dilation Transformations

Math Practice(s):
-Make sense of problems & persevere in solving them.
-Use appropriate tools strategically.

Learning Target(s):
-Understand that dilations take a line not passing through the center
 of a dilation to a parallel line.

Homework:
HW#11: 7c #1-4

Aug 8-12:20 PM

Warm-up

1. $\overline{CK}$ has the following endpoints C (4, 12) and K (20, 2). Dilate $\overline{CK}$ about the origin with a scale factor of $\frac{1}{4}$. Show both segments in the coordinate plane below. Label each endpoint with its name and coordinates.

C' (1, 3)

K' (5, 0.5)

c(4,12)

c(1,3)

K'(5,0.5)

K (20,2)
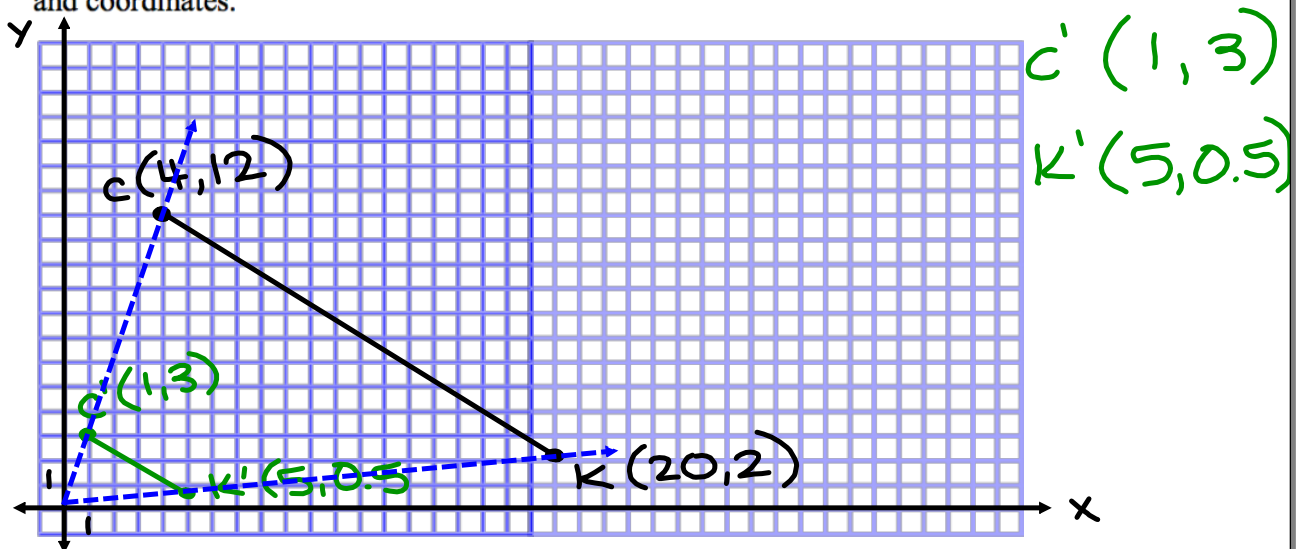
2. Using a straightedge, in the coordinate plane above, draw the ray from the origin through C' and from the origin through K'. Describe anything significant that you notice about both rays.

Each ray goes through the image and the pre image.

3. Determine the slope of $\overline{CK}$.

$-\frac{5}{8}$

4. What must the slope of $\overline{C'K'}$ be?

$-\frac{5}{8}$

(erase to show)

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Investigating Dilations of Objects _not_ in the Coordinate Plane

Dilations _____outside_____ of a coordinate plane occur in everyday life (i.e. when your smartphone zooms in and out on a picture).

In these dilations, corresponding _____vertices_____ lie on the _____same_____ ray through the

point of _____dilation_____.

Example 1: Dilate ΔABC about point A using a scale factor $k = 2$.

B'

52mm

124 m m
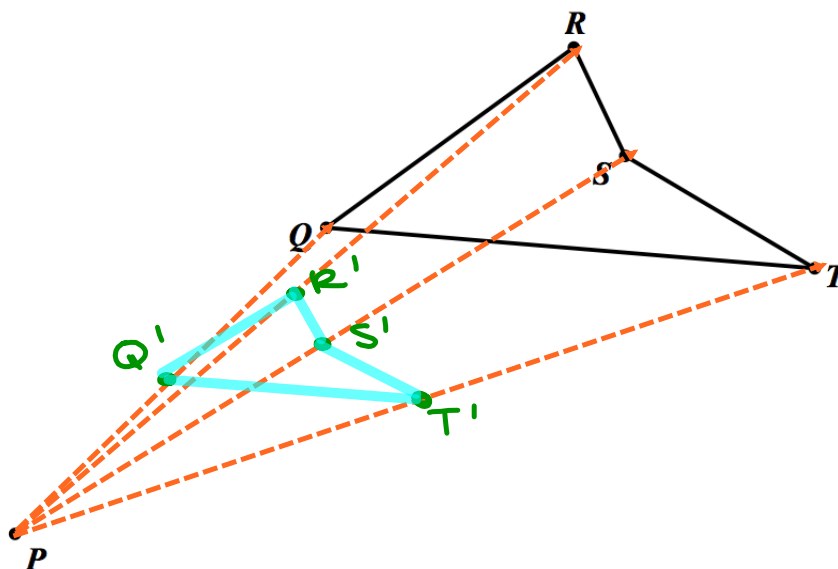
B

26mm

62 mm

C'

A=A'   76 m m   C

152 m m
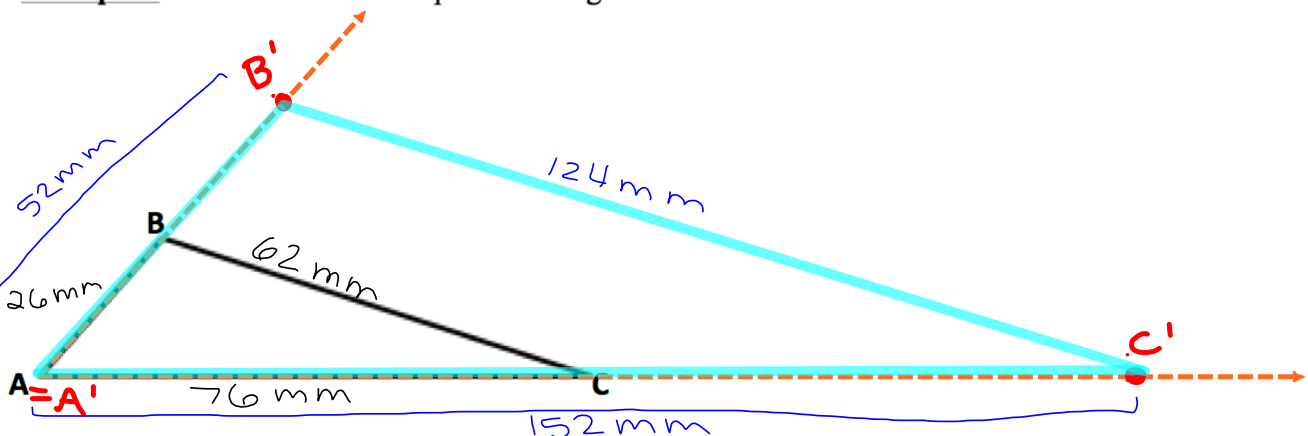
Steps to dilate a figure outside a coordinate plane
1. Draw a dotted ray from the point of dilation through each vertex.
2. Using a ruler, measure the length of each segment of the figure. (in mm)
3. Along the dotted ray, measure the appropriate scale factor of each vertex, marking the dilation appropriately, A', B', C', etc.
4. Connect the points of the dilated image.

Example 2: Dilate ΔABC about point B using a scale factor $k = 2.5$

B

65mm   26mm   62mm   155mm

76mm

A   C

A'

C'

190 m m

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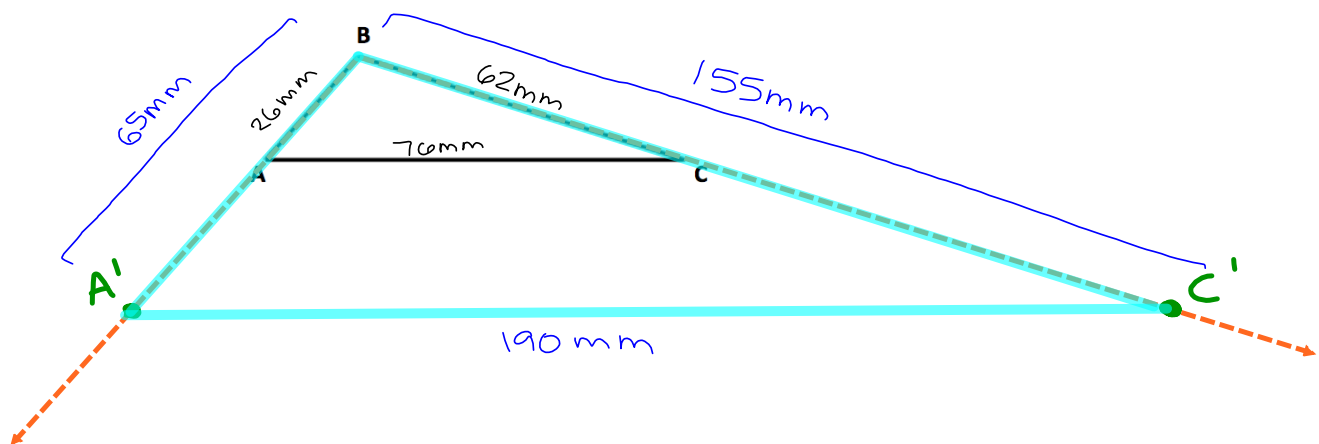
Example 4:   Dilate the figure below about point P using a scale factor scale factor $k = \frac{1}{2}$

(erase to show)

A dilation about point P with scale factor **k** is the function that takes each point Q to the point on ray PQ that is located a distance of **k** • PQ from P.

P is called the _____ center _____ of _____ dilation _____.

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Example 5: In each of the sketches below, ΔJ'I'K' is a dilation of ΔJIK about point P. Identify point P in both cases. Find the scale factor *k* that was used for both.

$$\frac{68}{45} \approx \boxed{1.5}$$

P • J = J'

I   45 mm   K

I'   68 mm   K'

P •

J'

40mm   60 mm

I   K

I'   K'

$$\frac{60}{40} = \boxed{1.5}$$