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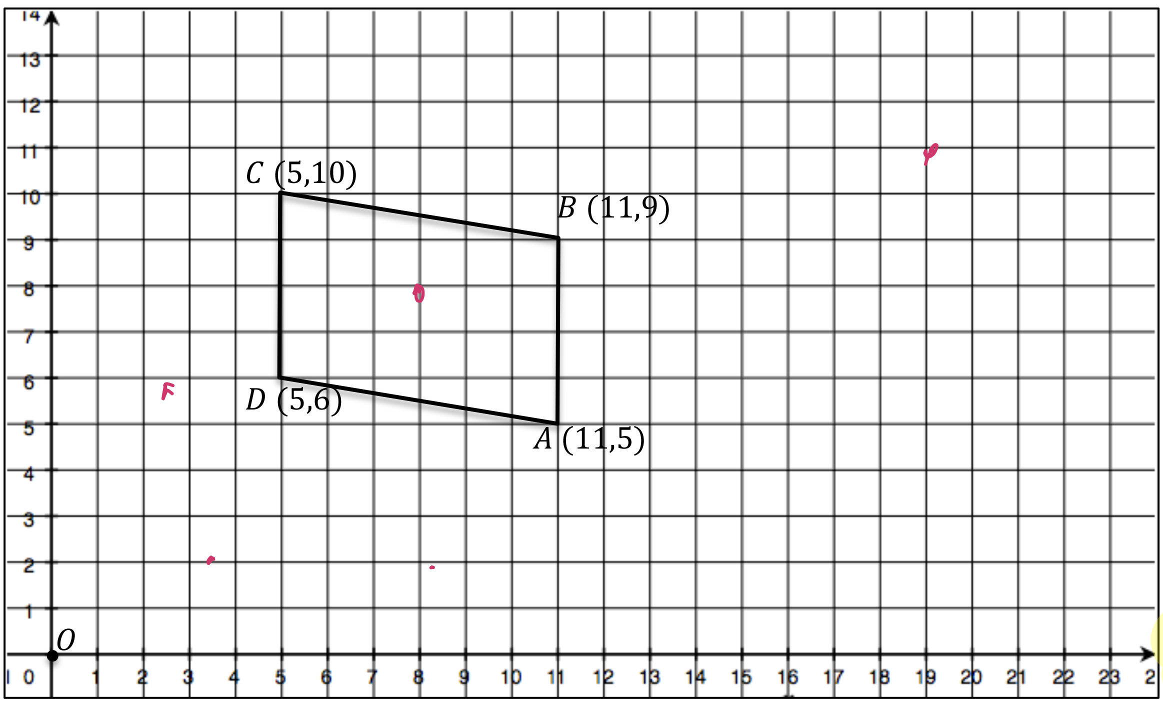
LEARNING OBJECTIVE: We will compute scale factors of dilations using the coordinate plane (G8M3L5)

CONCEPT DEVELOPMENT:

If the center of dilation is the origin $(0, 0)$, we can find the coordinates of the dilated point **by multiplying each of the coordinates in the original point by the scale factor.**

Example: If $r = 2$, and center of dilation is the origin.



center $(0,0)$

$A'(11\cdot 2, 5\cdot 2)$ $(22,10)$ $C'(10,20)$

$B'(22,18)$ $D'(10,12)$

If $A = (x,y)$
$A' = (rx, ry)$

Why does this work specifically for centers of dilation at the origin? Is there any rule we can create that will help us determine the dilated points regardless of where the center of dilation lies?

$A(x,y)$ $O(a,b)$

r

$A'(rx-a, ry-b)$

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Guided Practice:

Steps for Determining the Dilated Points of Geometric Figures when Center is at the Origin

1. Make note of the scale factor, the center of dilation and the points in question.
2. If the center of dilation is the origin, simply multiply the coordinate points of the figure by the scale factor to obtain the coordinates of the dilated point.

Parallelogram $ABCD$ has coordinates of $(-2, 4), (4, 4), (2, -1)$, and $(-4, -1)$ respectively. Find the coordinates of $A'B'C'D'$ after a dilation from the origin with a scale factor of 3. A' $(-2\cdot3, 4\cdot3) = (-6, 12)$ B' $(4\cdot3, 4\cdot3) = (12, 12)$ C' $(2\cdot3, -1\cdot3) = (6, -3)$ D' $(-4\cdot3, -1\cdot3) = (-12, -3)$	Parallelogram $ABCD$ has coordinates of $(-3, 3), (1, 3), (2, -7)$, and $(-2, -7)$ respectively. Find the coordinates of $A'B'C'D'$ after a dilation from the origin with a scale factor of 2. A' $(-6, 6)$ B' $(2, 6)$ C' $(4, -14)$ D' $(-4, -14)$
Pentagon ABCDE has coordinates of $(1, 8), (2, 5)(4, 5), (5, 8)$, and $(3,10)$ respectively. Find the coordinates of $A'B'C'D'E'$ after a dilation from the origin with a scale factor of $\frac{3}{4}$. A' $(\frac{3}{4}, 6)$ B' $(\frac{3}{2}, \frac{15}{4})$ C' $(3, \frac{15}{4})$ D' $(\frac{15}{4}, 6)$ E' $(\frac{9}{4}, \frac{15}{2})$	Triangle ABC has coordinates of $(-12,4), (15, 8)$, and $(8,2)$ respectively. Find the coordinates of $A'B'C'$ after a dilation from the origin with a scale factor of $\frac{1}{4}$. A' $(-3, 1)$ B' $(\frac{15}{4}, 2)$ C' $(2, \frac{1}{2})$
Rectangle ABCD has coordinates of $(-1, 4), (-1, 9), (12,4), (12, 9)$ respectively. Find the coordinates of $A'B'C'D'$ after a dilation from the origin with a scale factor of $\frac{5}{3}$. A' $(-\frac{5}{3}, \frac{20}{3})$ B' $(-\frac{5}{3}, 15)$ C' $(20, \frac{20}{3})$ D' $(20, 15)$	Quadrilateral ABCD has coordinates of $(-3, -4), (1,1), (2,6), (4, -1)$ respectively. Find the coordinates of $A'B'C'D'$ after a dilation from the origin with a scale factor of 5. A' $(-15, -20)$ B' $(5, 5)$ C' $(10, 30)$ D' $(20, -5)$

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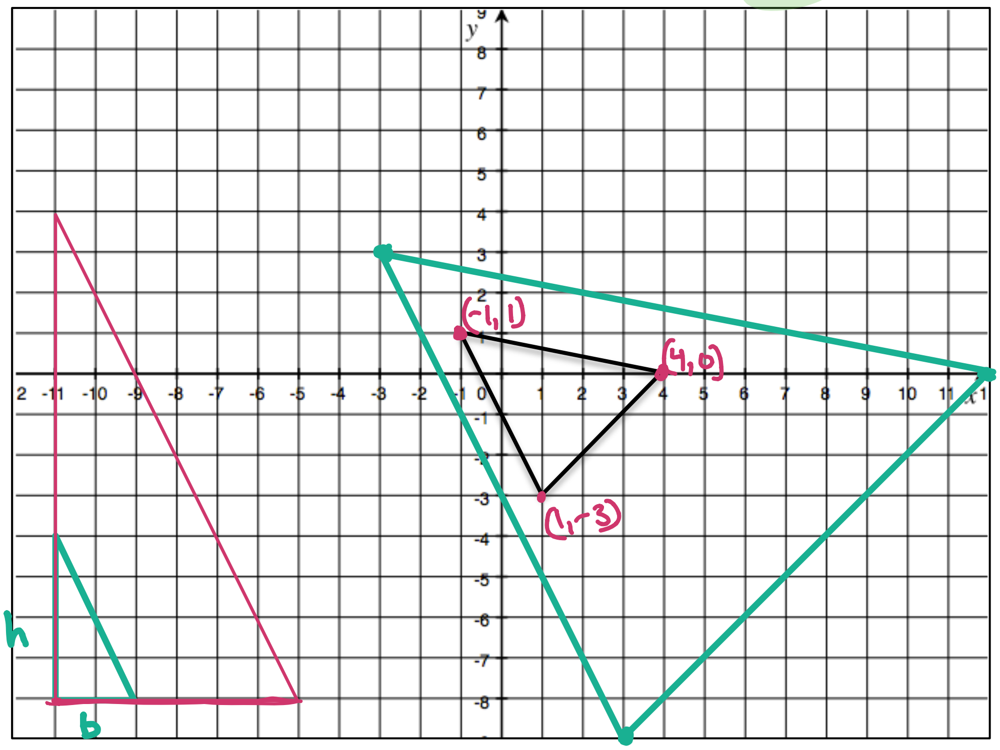
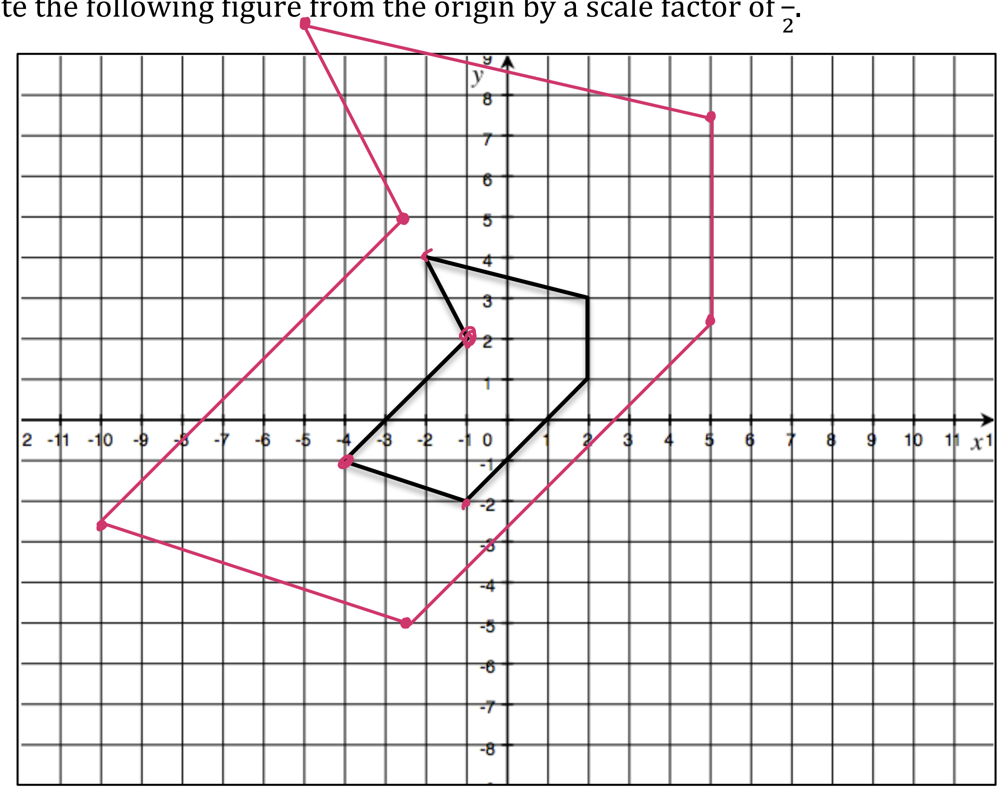
Dilate the following triangle from the origin by a scale factor of 3.



$\frac{1}{2}bh$

$\frac{1}{2}(3b)(3h)$

Dilate the following figure from the origin by a scale factor of $\frac{5}{2}$.



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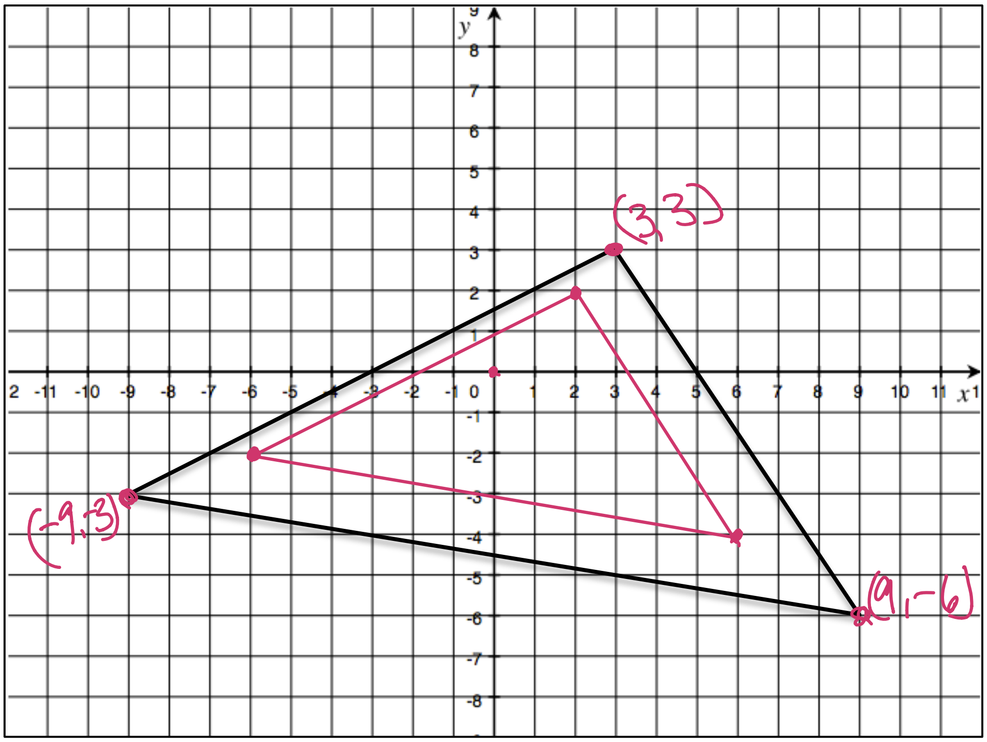
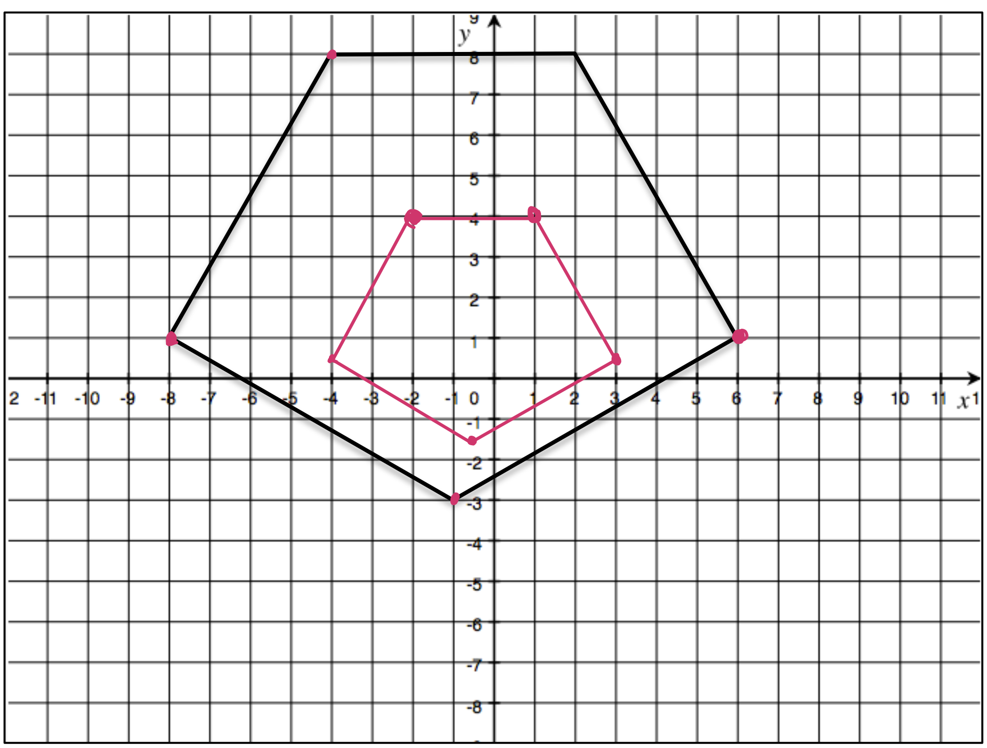
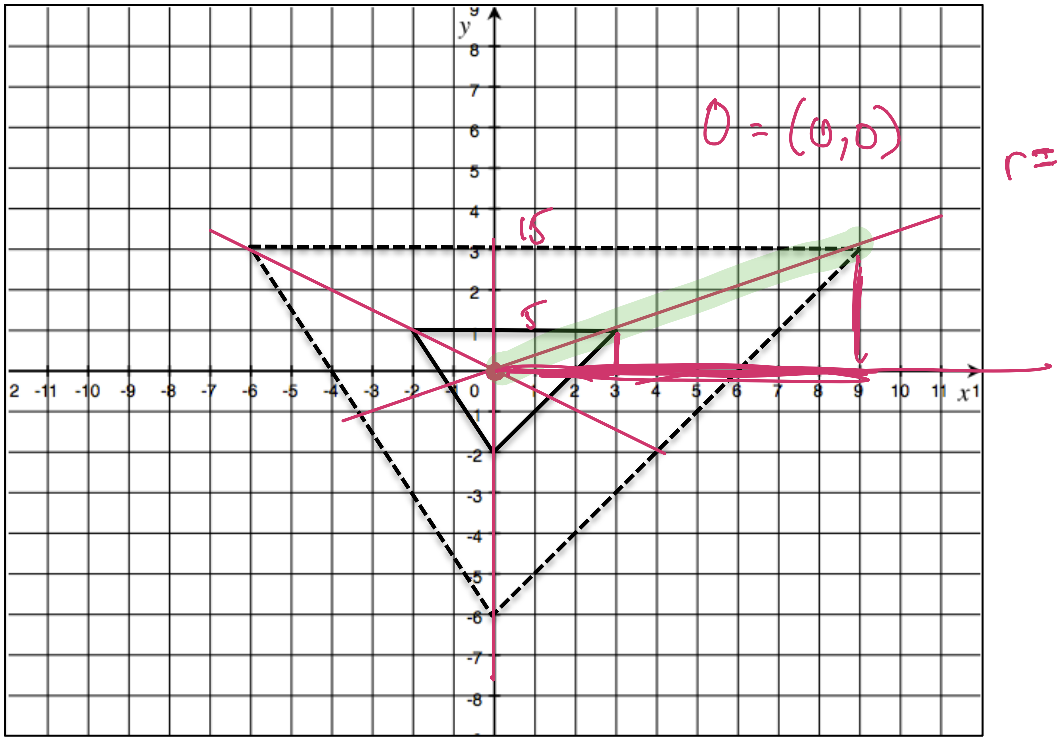
Dilate the following triangle from the origin by a scale factor of $\frac{2}{3}$.



Dilate the following figure from the origin by a scale factor of $\frac{1}{2}$.

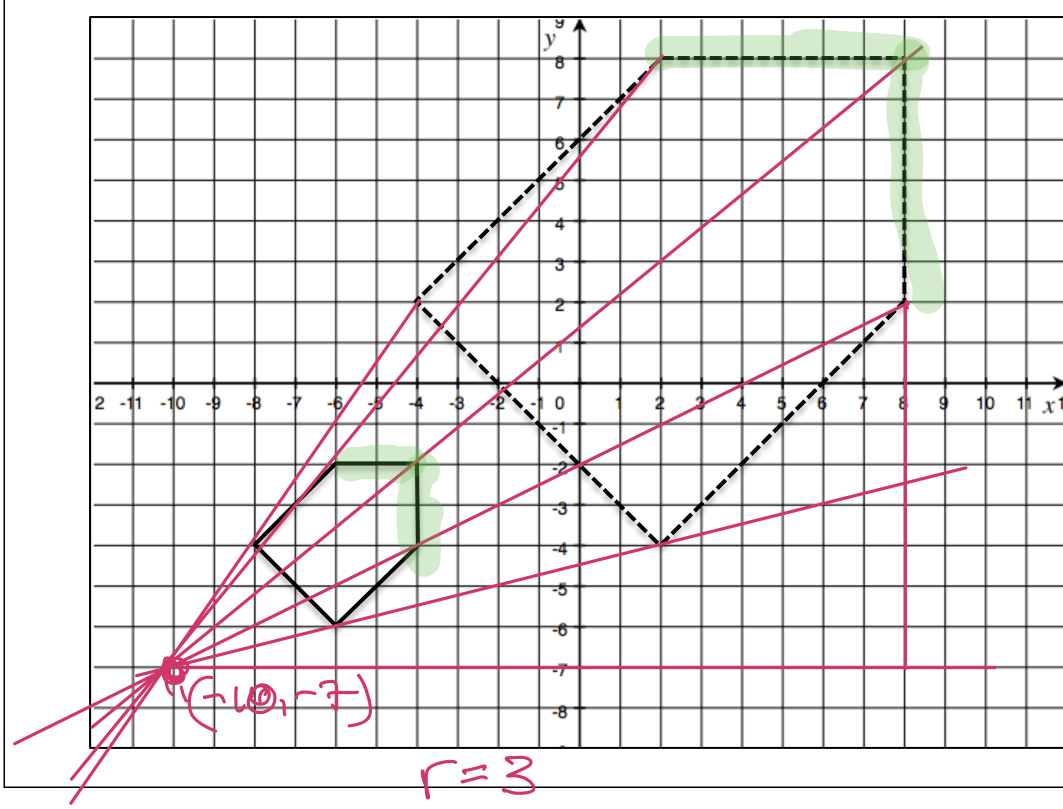


Find the scale factor of the figure and the center Point of Dilation. Dilation is dashed.



r=3

Find the scale factor of the figure and the center Point of Dilation. Dilation is dashed



r=3

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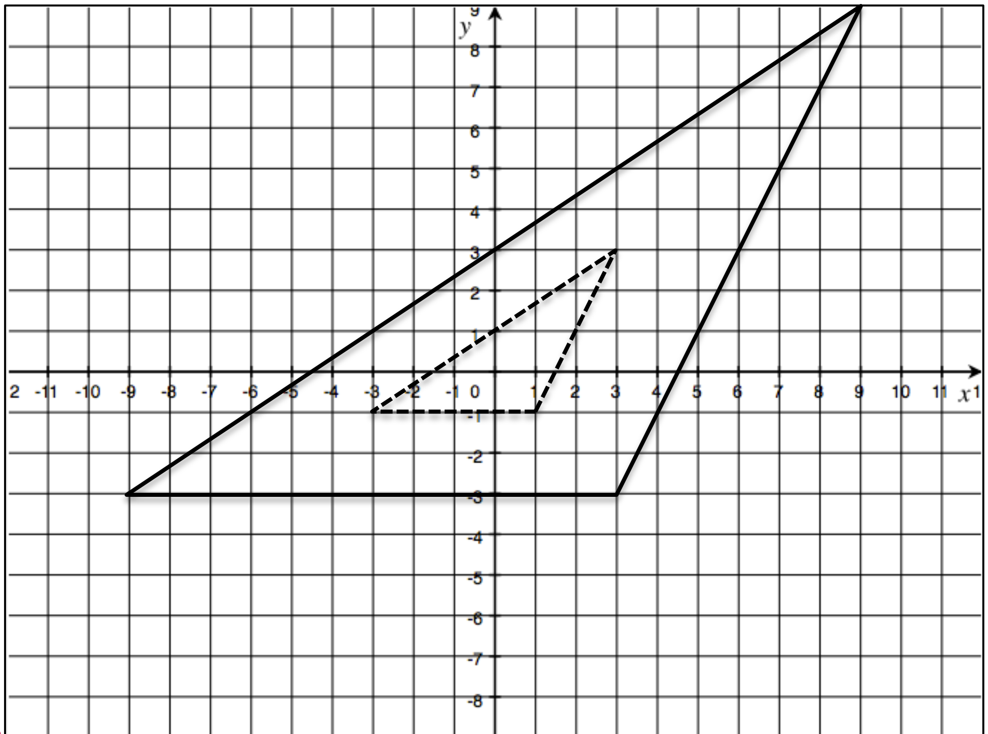
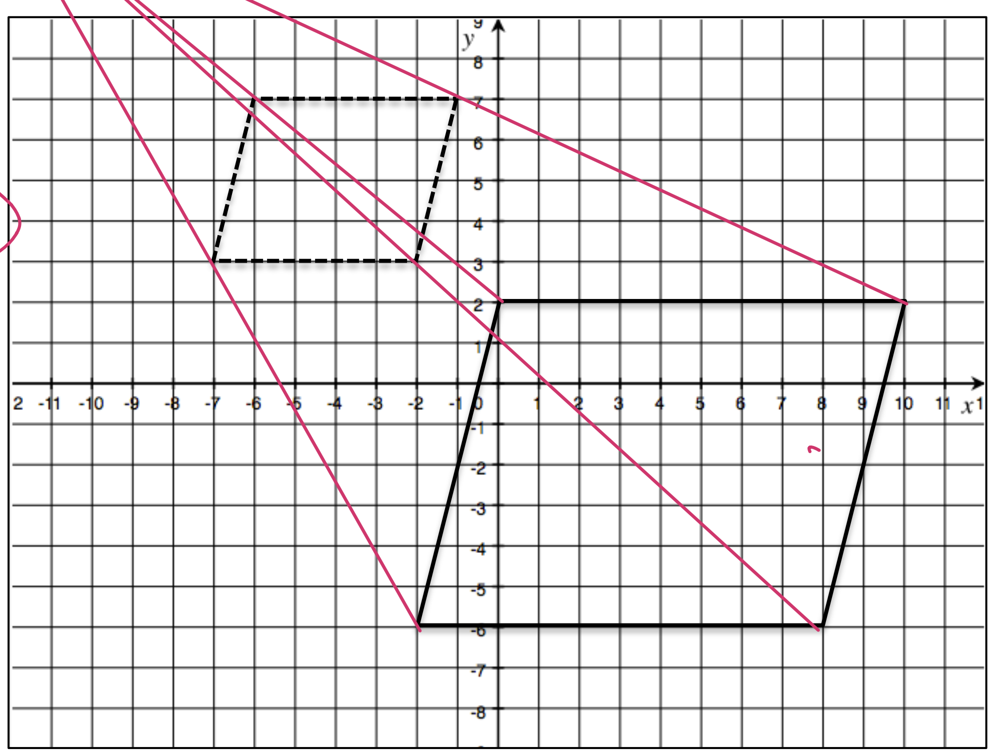
Find the scale factor of the figure and the center Point of Dilation. Dilation is dashed.



Find the scale factor of the figure and the center Point of Dilation. Dilation is dashed.

(-12, 12)



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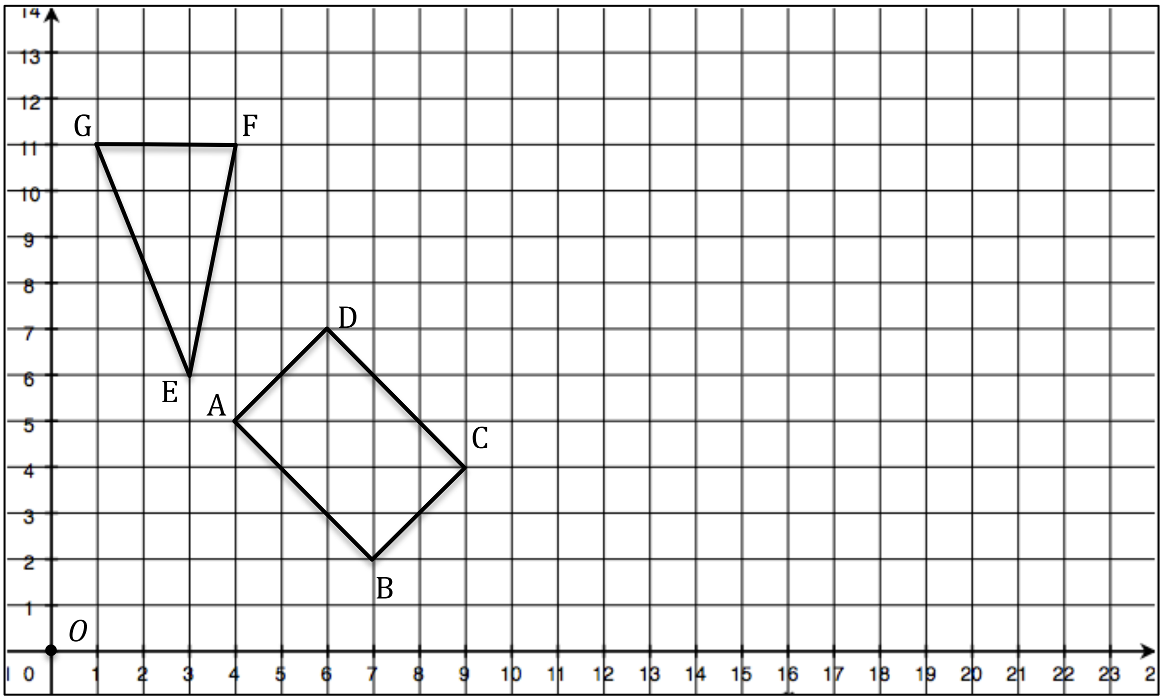
Activating Prior Knowledge:

We already know how to perform dilations on the coordinate plane: Find the coordinates of the new figures after dilationS from the origin with a scale factor of 7/2. (don't graph!)



Closure:

GIVE EXIT TICKET from lesson 6

Teacher Notes:

Homework is going to be from ENY lesson 6—pages S27-29 5 problems

Number Talk: Which two are closer: ¼, ½ and 3/5?