6.6 Perform Similarity Transformations

Before You performed congruence transformations.

Now You will perform dilations.

Why? So you can solve problems in art, as in Ex 26.

RECALL:

Coordinate Notation for a DILATION: $(x, y) \rightarrow (kx, ky)$

where k is the scale factor.

If | k | < 1 then the dilation is a reduction.

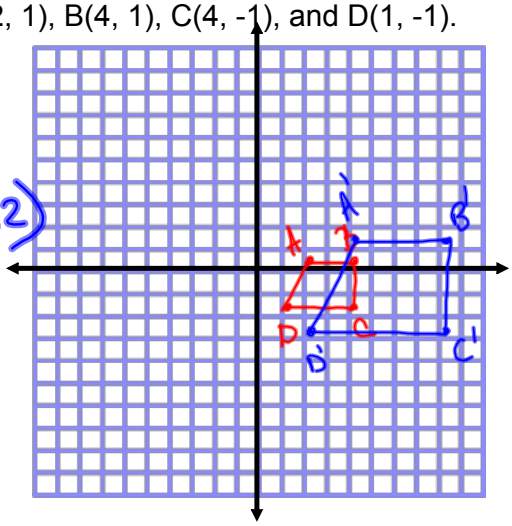
If | k | > 1 then the dilation is an enlargement.

EXAMPLE 1:

Draw a dilation of quadrilateral ABCD with vertices A(2, 1), B(4, 1), C(4, -1), and D(1, -1).

Use a scale factor of 2.

Pre-Image	Image
A(2, 1) →	A'(2·2, 2·1) = A'(4, 2)
B(4, 1) →	B'(8, 2)
C(4, -1) →	C'(8, -2)
D(1, -1) →	D'(2, -2)



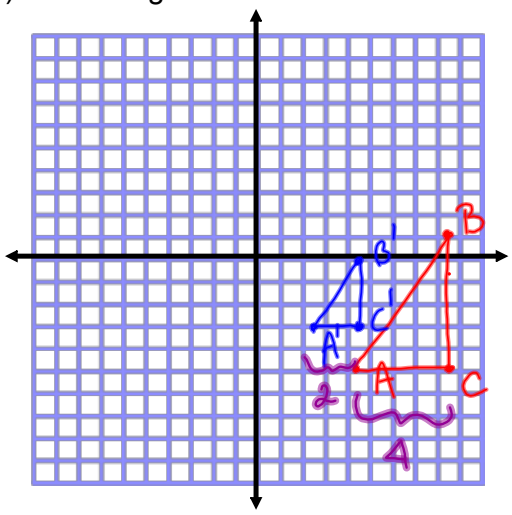
EXAMPLE 2:

A triangle has the vertices A(4, -4), B(8, 2), and C(8, -4). The image of △ABC after a dilation with a scale factor of 1/2 is △DEF.

a. Sketch △ABC and △DEF.

b. Verify that △ABC and △DEF are similar.

Pre-Image	Image
A(4, -4) →	A'(2, -2)
B(8, 2) →	B'(4, 1)
C(8, -4) →	C'(4, -2)



EXAMPLE 3:

You are making your own photo stickers. Your photo is 4" by 4". The image on the stickers is 1.1" x 1.1". What is the scale factor of the reduction?

$$S.F. = \frac{\text{Image}}{\text{Pre-Image}} = \frac{1.1}{4} = \frac{11}{40}$$

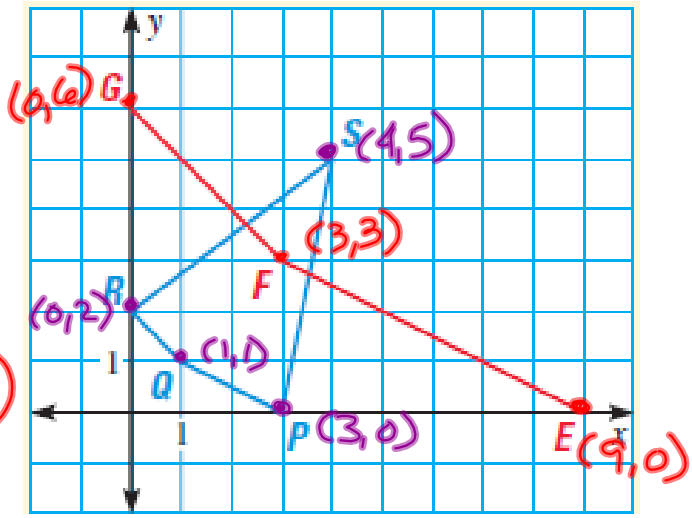
EXAMPLE 4:

You want to create a quadrilateral EFGH that is similar to quadrilateral PQRS.

What are the coordinates of H?

$$S.F. = \frac{9}{3} = 3$$

$$S(4,5) \xrightarrow[\times 3]{\times 3} H(12,15)$$



Questionnaire