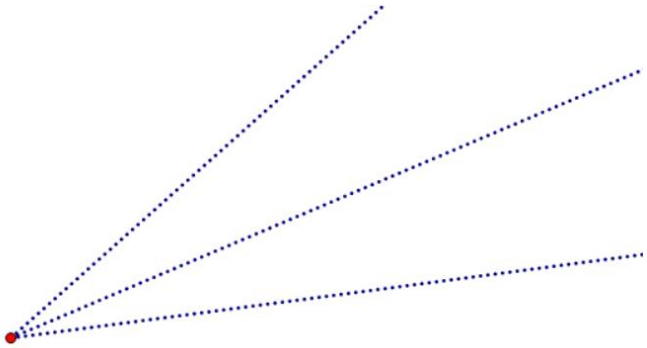
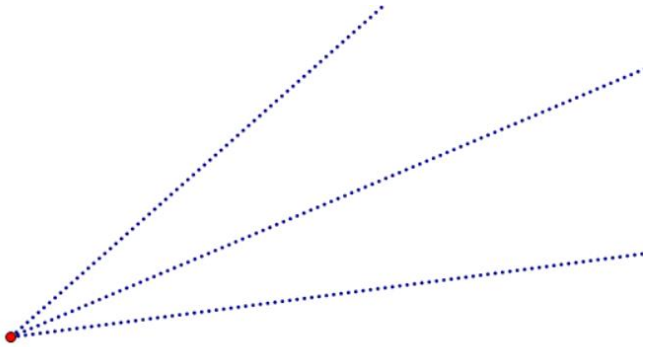
9.7 Dilations/7.2 Similarity

Using a ruler, double the size of the first figure, and reduce the size of the second figure by ½.

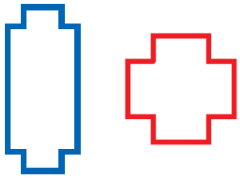




Dilation: a transformation that changes the size but not the shape of a figure.

Scale Factor: value that enlarges or reduces the size of a figure.

Example 1: Identify which transformation appears to be a dilation.

a) 

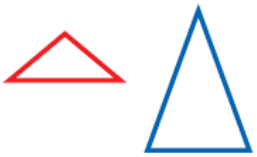
no

b) 

yes

c) 

yes

d) 

no

Center	Enlargement	Reduction
Point that the dilation occurs around.	$k > 1$ Scale factor is greater than 1	$0 < k < 1$ Scale factor in between 0 & 1

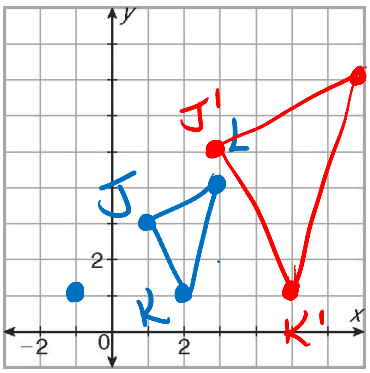
Example 2: Dilate the figure around the given center with the given scale factor.

a) $J(1, 3)$, $K(2,1)$, $L(3, 4)$

scale factor: 2

Center: (-1,1)

K<3,0>
J<2,2>
L<4,3>



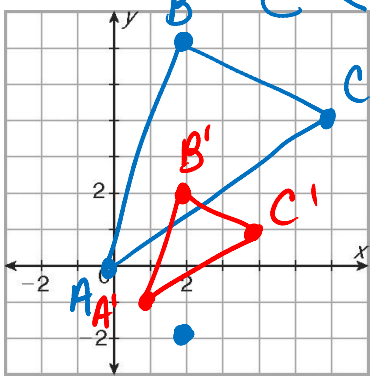
K'<6,0>
J'<4,4>
L'<8,6>

b) $A(0, 0)$, $B(2, 6)$, $C(6, 4)$

scale factor: $\frac{1}{2}$

Center: (2,-2)

A<-2,2>
B<0,8>
C<4,6>



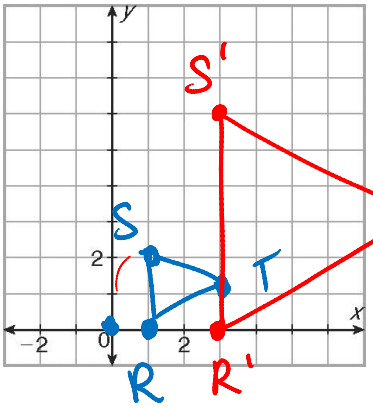
A'<-1,1>
B'<0,4>
C'<2,3>

c) $R(1, 0)$, $S(1, 2)$, $T(3, 1)$

scale factor: 3

Center: (0,0)

R<1,0>
S<1,2>
T<3,1>



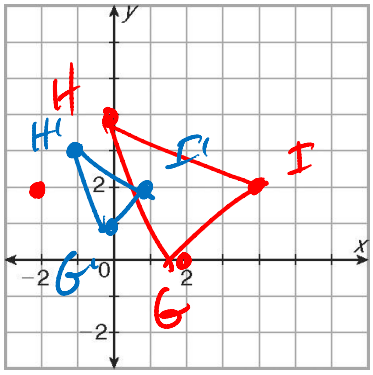
R'<3,0>
S'<3,6>
T'<9,3>

d) $G(2, 0)$, $H(0, 4)$, $I(4, 2)$

scale factor: $\frac{1}{2}$

Center: (-2,2)

H<2,2>
I<6,0>
G<4,-2>



H'<1,1>
I'<3,0>
G'<2,-1>

3. An artist is creating a large painting from a photograph by dividing the photo into squares and dilating each square by a scale factor of 4. If the photograph is 20 cm by 25 cm, what is the perimeter of the painting?

4(25)

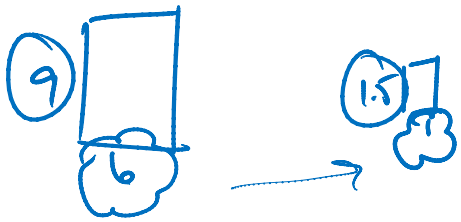
4(20)

100

80

P = 2(80) + 2(100)
= 160 + 200
= 360 cm

4. An engraver is designing a stamp to celebrate Asian American history. Her original version of the stamp is a rectangle 6 inches by 9 inches. When the stamp is produced, it will be a rectangle 1 inch by 1.5 inches. Find the scale factor of the reduction.



$\frac{6}{1}$ OR $\frac{1}{6}$