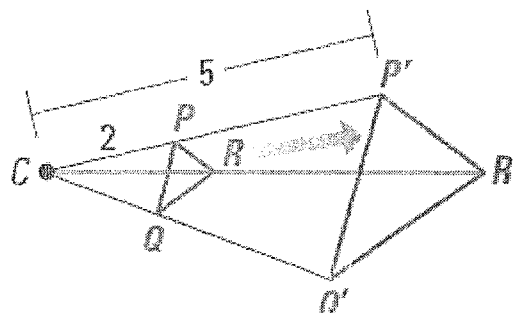
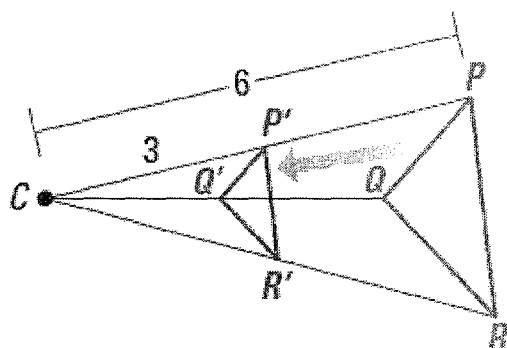


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Date: \_\_\_\_\_

## Dilations

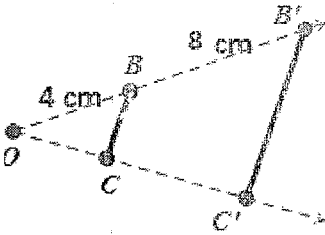
The dilation is a **reduction** if  $0 < k < 1$  and it is an **enlargement** if  $k > 1$ .



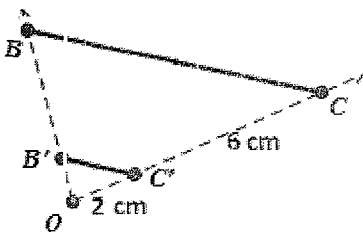
## SCALE FACTOR:

| Center of Dilation (Inside)  | Center of Dilation (On)  | Center of Dilation (Outside)  |
|--|--|---|
| <p>A diagram showing a triangle <math>ABC</math> and its dilated image <math>A'B'C'</math>. The center of dilation <math>O</math> is located inside the triangle. Dashed lines connect <math>O</math> to each vertex, showing that <math>O</math> lies on the segments <math>AA'</math>, <math>BB'</math>, and <math>CC'</math>.</p> | <p>A diagram showing a triangle <math>ABC</math> and its dilated image <math>A'B'C'</math>. The center of dilation <math>O</math> is located on the side <math>AB</math>. Dashed lines connect <math>O</math> to each vertex, showing that <math>O</math> lies on the segments <math>AA'</math>, <math>BB'</math>, and <math>CC'</math>.</p> | <p>A diagram showing a triangle <math>ABC</math> and its dilated image <math>A'B'C'</math>. The center of dilation <math>O</math> is located outside the triangle. Dashed lines connect <math>O</math> to each vertex, showing that <math>O</math> lies on the extensions of the segments <math>AA'</math>, <math>BB'</math>, and <math>CC'</math>.</p> |

1. In the diagram below, the center of dilation is point O. Find the scale factor. Is this a reduction or enlargement?

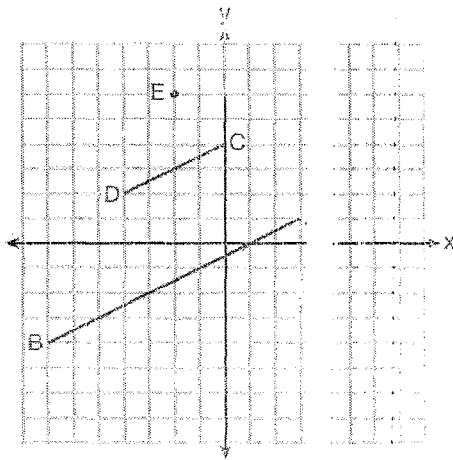


2. In the diagram below, the center of dilation is point O. Find the scale factor. Is this a reduction or an enlargement?



3.

In the diagram below,  $\overline{CD}$  is the image of  $\overline{AB}$  after a dilation of scale factor  $k$  with center  $E$ .

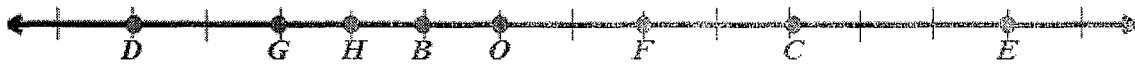


Which ratio is equal to the scale factor of the dilation?

- (1)  $\frac{EC}{EA}$  (3)  $\frac{EA}{BA}$   
 (2)  $\frac{BA}{EA}$  (4)  $\frac{EA}{EC}$

4.

Determine the point.



a)  $D_{H,4}(B) = (\quad)$       b)  $D_{H,3}(H) = (\quad)$       c)  $D_{H,-2}(G) = (\quad)$

5.

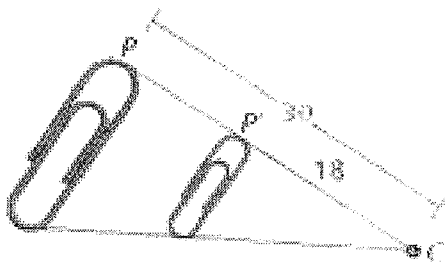
If the dilation  $D_k(-2,4)$  equals  $(1,-2)$ , the scale factor  $k$  is equal to

- A)  $\frac{1}{2}$       B)  $-2$       C)  $2$       D)  $-\frac{1}{2}$

6. Which transformation represents a dilation?

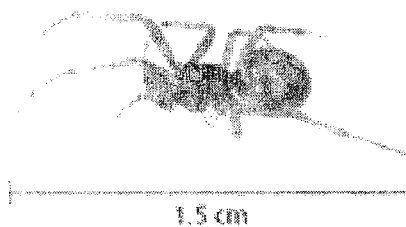
- 1)  $(8,4) \rightarrow (11,7)$   
 2)  $(8,4) \rightarrow (-8,4)$   
 3)  $(8,4) \rightarrow (-4,-8)$   
 4)  $(8,4) \rightarrow (4,2)$

7. Find the scale factor. Is this a reduction or an enlargement?

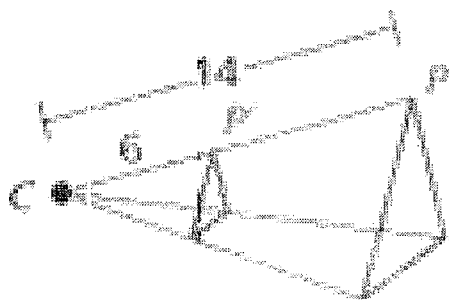


8.

You are using a magnifying glass that shows the image of an object that is six times the object's actual size. Determine the length of the image of the spider seen through the magnifying glass.



9. Find the scale factor. Is this a reduction or an enlargement?

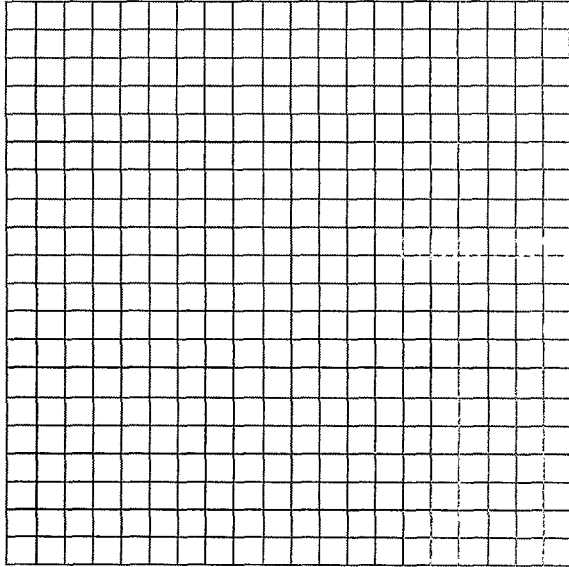


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## Dilations

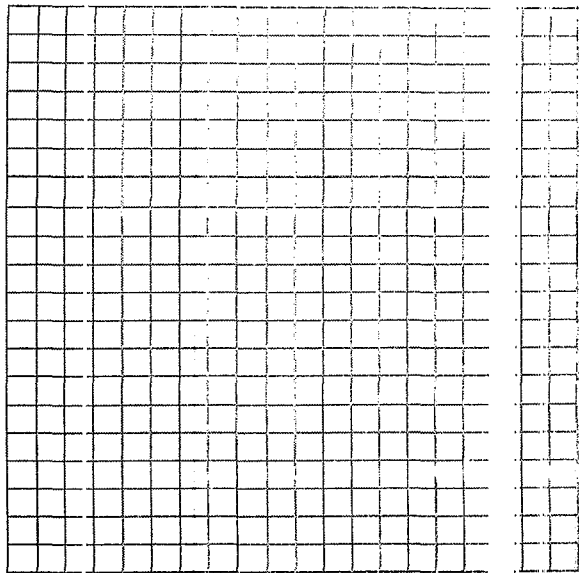
1. What are the coordinates of point  $(-1, 4)$  under dilation  $D_{-2}$ , centered at the origin?



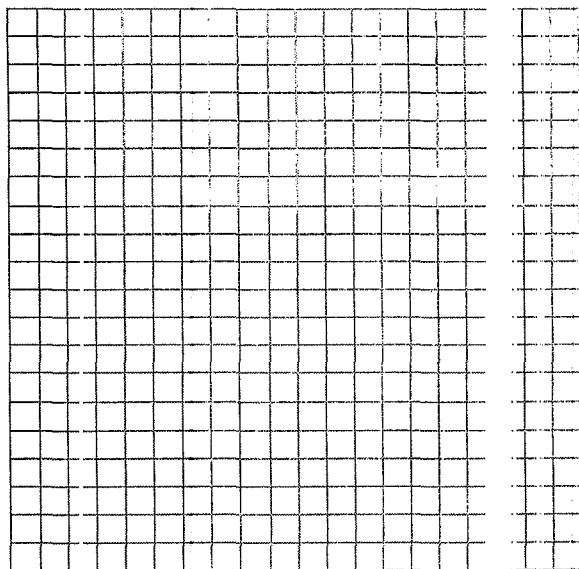
2. A. The image of point  $A$  after a dilation, centered at the origin, of 3 is  $(6, 15)$ . What was the original location of point  $A$ ?

B. Find the image of  $A(2, -3)$  after the dilation described above.

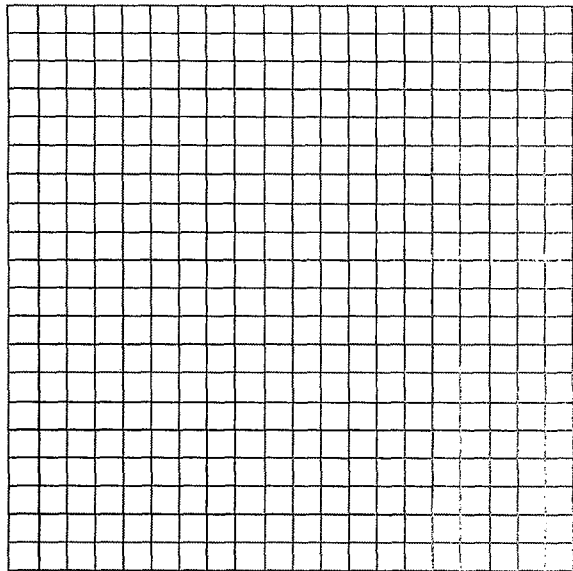
3. A. Find a coordinate rule for the dilation with center  $(5, -3)$  and scale factor 2.



- B. Using your coordinate rule, find the image of  $A(2, -3)$  after the dilation described above.

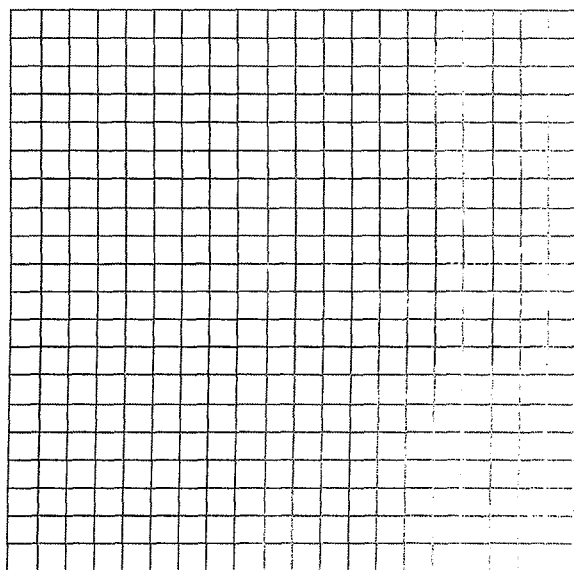


4. Find the coordinates of the image of  $(2, 6)$  after a dilation of scale factor  $-2$  with the center of dilation at  $(-3, 4)$ .

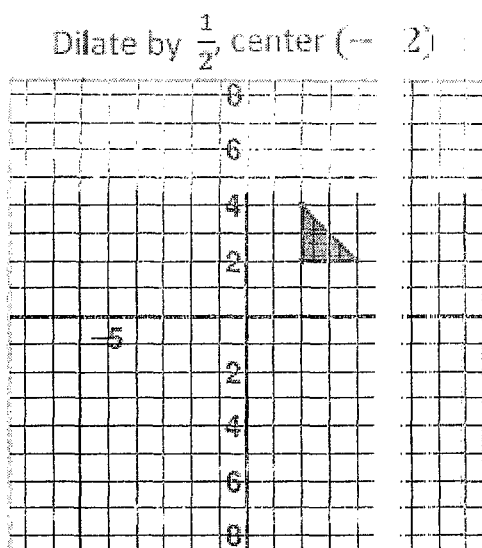


5. The point  $A(6, 3)$  maps onto  $A'(2, 1)$  under a dilation with respect to the origin. What is the constant of dilation?

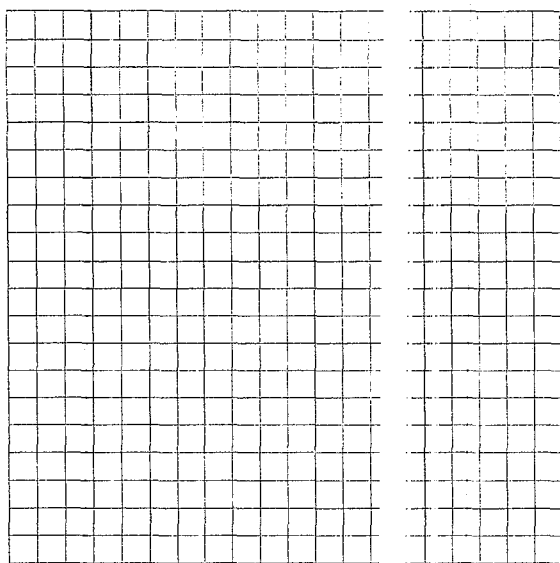
6. Graph triangle  $ABC$ ,  $A(-2, 4)$ ,  $B(-1, 1)$ , and  $C(-4, 2)$ .  
Dilate the triangle with a scale factor of  $2$ , centered at  $(2, 1)$ .



7. Graphing is optional.

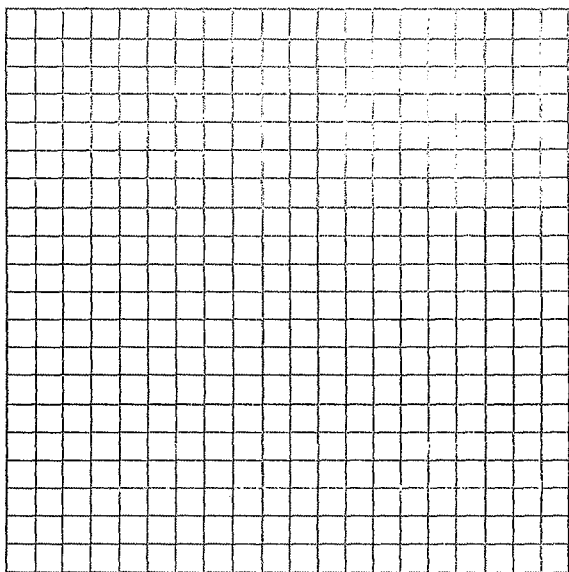


8. Triangle  $ABC$  has vertices  $A(6,6)$ ,  $B(9,0)$ , and  $C(3,-3)$ . State and label the coordinates of  $\triangle A'B'C'$ , the image of  $\triangle ABC$  after a dilation of  $D_{\frac{1}{3}}$ , centered at the origin.



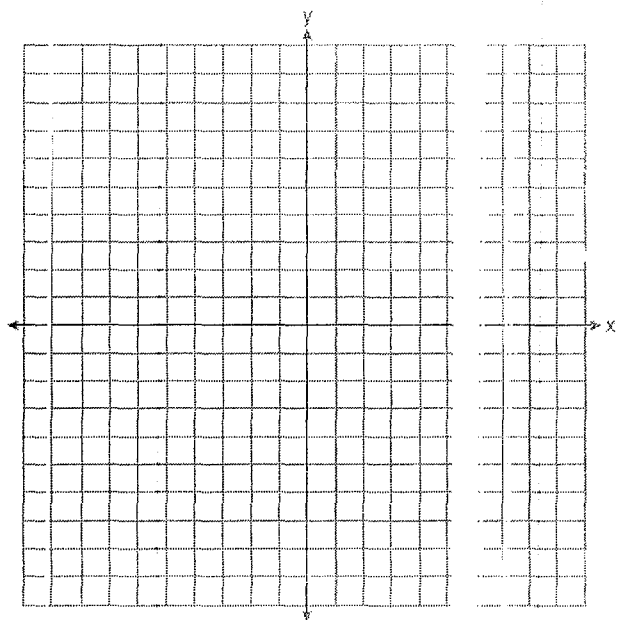


9. On the accompanying grid, graph and label quadrilateral  $ABCD$ , whose coordinates are  $A(-1, 3)$ ,  $B(2, 0)$ ,  $C(2, -1)$ , and  $D(-3, -1)$ . Graph, label, and state the coordinates of  $A'B'C'D'$ , the image of  $ABCD$  under a dilation of 2, where the center of dilation is  $(1, 3)$ .

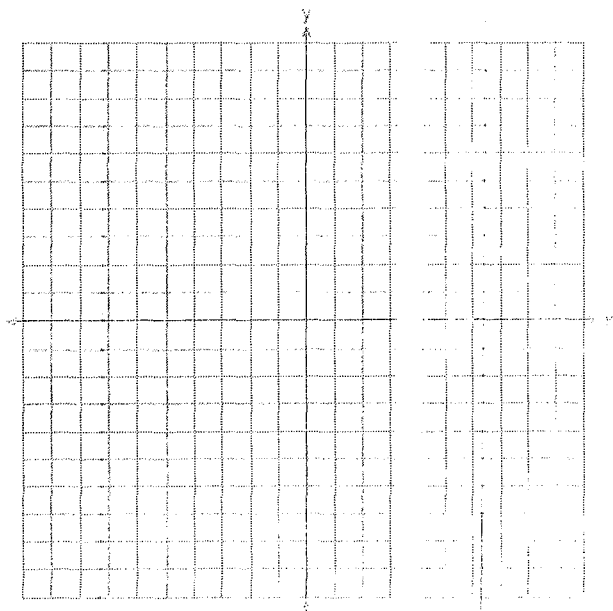


10. Under a dilation where the center of dilation is the origin, the image of  $A(-2, -3)$  is  $A'(-6, -9)$ . What are the coordinates of  $B'$ , the image of  $B(4, 0)$  under the same dilation?

11. Triangle  $ABC$  has coordinates  $A(-1)$ ,  $B(3,1)$ , and  $C(0,-3)$ . On the set of axes below, graph and label  $\triangle A'B'C'$ , the image of  $\triangle ABC$  after a dilation of 2.



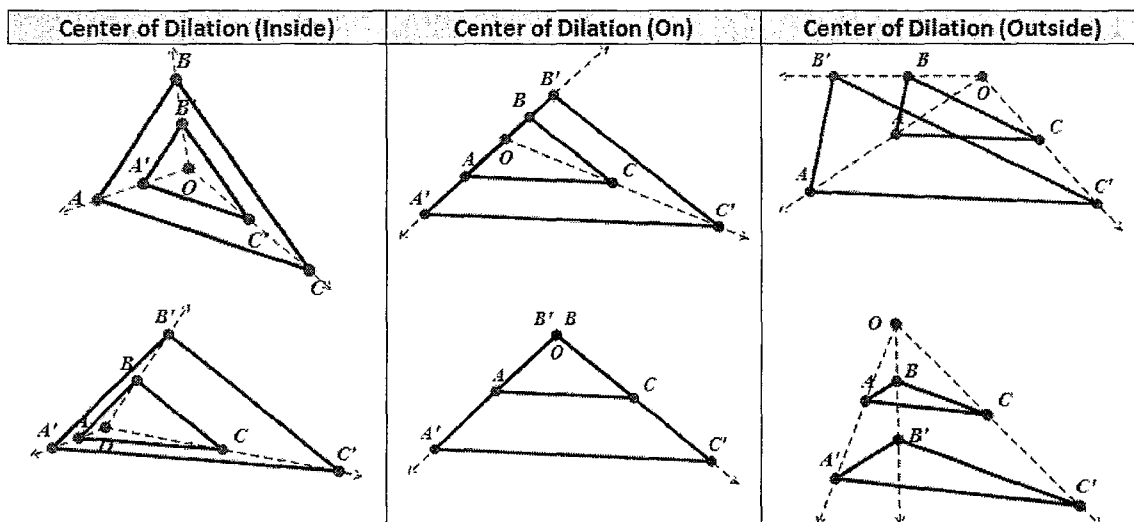
12. On the accompanying set of axes, graph  $\triangle ABC$  with coordinates  $A(-1,2)$ ,  $B(0,6)$ , and  $C(5,4)$ . Then graph  $\triangle A'B'C'$ , the image of  $\triangle ABC$  after a dilation of 3, centered at  $(1, -1)$ . *Hint: Your image will not fit on the grid unless you change your scale.*



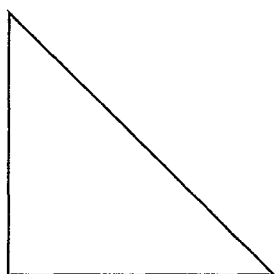
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## Dilation Constructions

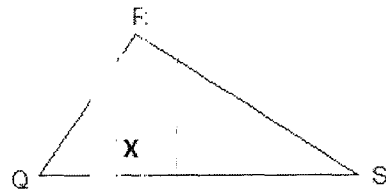


- Using a compass and a straightedge, dilate the given triangle by a scale factor of 2 with the center of dilation at Point P.

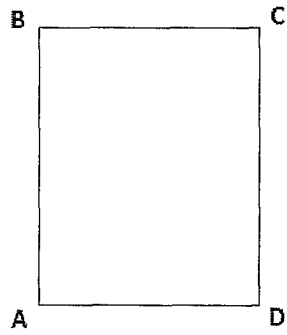


• P

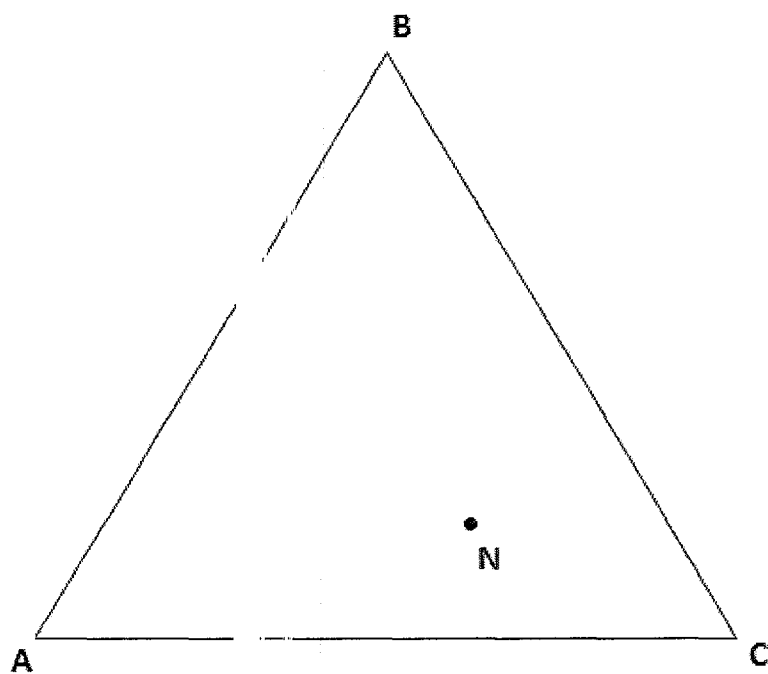
2. Dilate Triangle QRS by a scale factor of 3 with the center of dilation Point X.



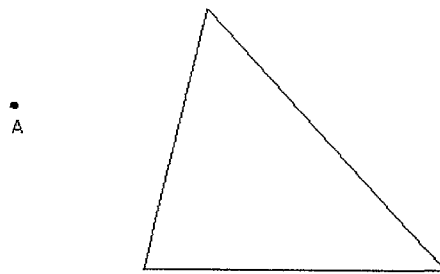
3. Dilate Quadrilateral ABCD by a scale factor of 2 with the center of dilation at Point A.



4. Dilate Triangle ABC by a scale factor of  $\frac{1}{2}$  with the center of dilation at Point N.



5. Dilate the given triangle by a scale factor of  $-2$  with the center of dilation at A.



6. Dilate the given line segment by a scale factor of  $\frac{1}{3}$  with the center of dilation at A.

A

