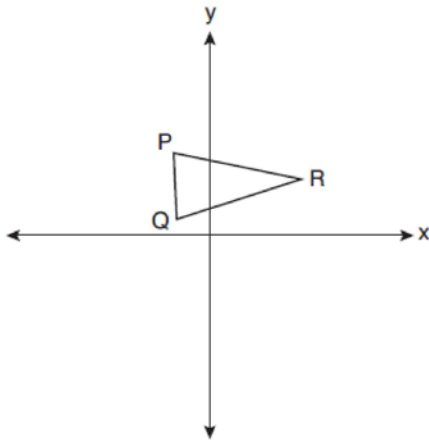


**G.CO.A.5: Compositions of Transformations 1**

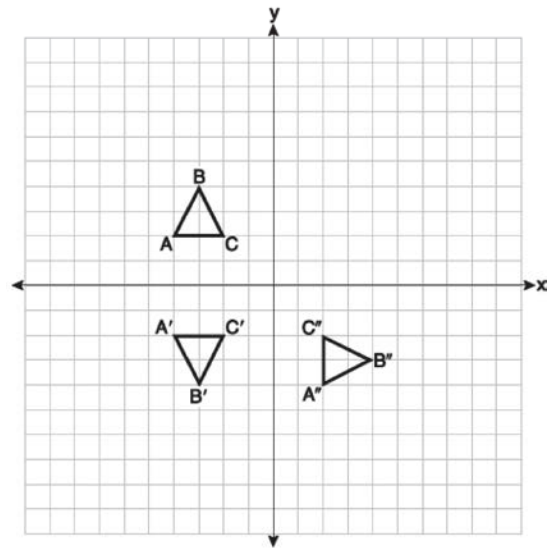
- 1 Triangle  $PQR$  is shown on the set of axes below.



Which quadrant will contain point  $R''$ , the image of point  $R$ , after a  $90^\circ$  clockwise rotation centered at  $(0,0)$  followed by a reflection over the  $x$ -axis?

- 1) I
- 2) II
- 3) III
- 4) IV

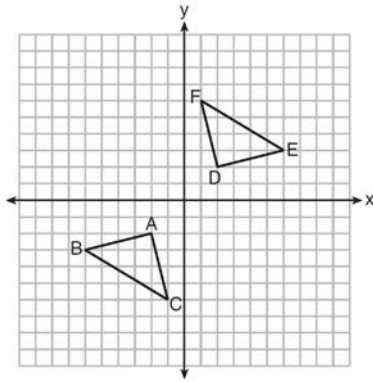
- 2 On the set of axes below, triangle  $ABC$  is graphed. Triangles  $A'B'C'$  and  $A''B''C''$ , the images of triangle  $ABC$ , are graphed after a sequence of rigid motions.



Identify which sequence of rigid motions maps  $\triangle ABC$  onto  $\triangle A'B'C'$  and then maps  $\triangle A'B'C'$  onto  $\triangle A''B''C''$ .

- 1) a rotation followed by another rotation
- 2) a translation followed by a reflection
- 3) a reflection followed by a translation
- 4) a reflection followed by a rotation

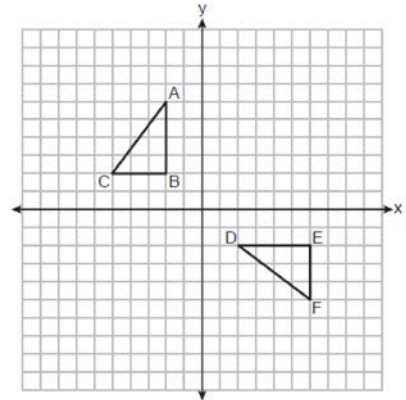
- 3 Triangle  $ABC$  and triangle  $DEF$  are graphed on the set of axes below.



Which sequence of transformations maps triangle  $ABC$  onto triangle  $DEF$ ?

- 1) a reflection over the  $x$ -axis followed by a reflection over the  $y$ -axis
- 2) a  $180^\circ$  rotation about the origin followed by a reflection over the line  $y = x$
- 3) a  $90^\circ$  clockwise rotation about the origin followed by a reflection over the  $y$ -axis
- 4) a translation 8 units to the right and 1 unit up followed by a  $90^\circ$  counterclockwise rotation about the origin

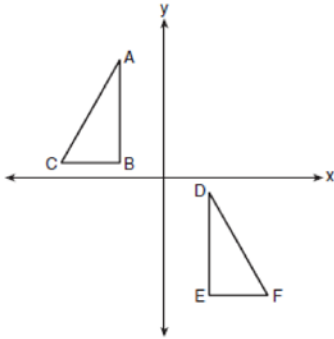
- 4 On the set of axes below, congruent triangles  $ABC$  and  $DEF$  are drawn.



Which sequence of transformations maps  $\triangle ABC$  onto  $\triangle DEF$ ?

- 1) A counterclockwise rotation of  $90$  degrees about the origin, followed by a translation 8 units to the right.
- 2) A counterclockwise rotation of  $90$  degrees about the origin, followed by a reflection over the  $y$ -axis.
- 3) A counterclockwise rotation of  $90$  degrees about the origin, followed by a translation 4 units down.
- 4) A clockwise rotation of  $90$  degrees about the origin, followed by a reflection over the  $x$ -axis.

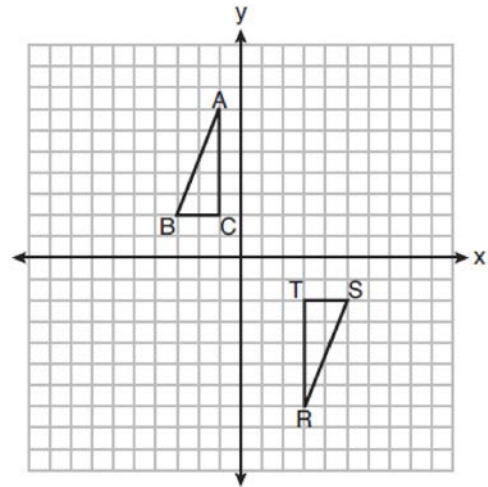
- 5 In the diagram below,  $\triangle ABC \cong \triangle DEF$ .



Which sequence of transformations maps  $\triangle ABC$  onto  $\triangle DEF$ ?

- 1) a reflection over the  $x$ -axis followed by a translation
- 2) a reflection over the  $y$ -axis followed by a translation
- 3) a rotation of  $180^\circ$  about the origin followed by a translation
- 4) a counterclockwise rotation of  $90^\circ$  about the origin followed by a translation

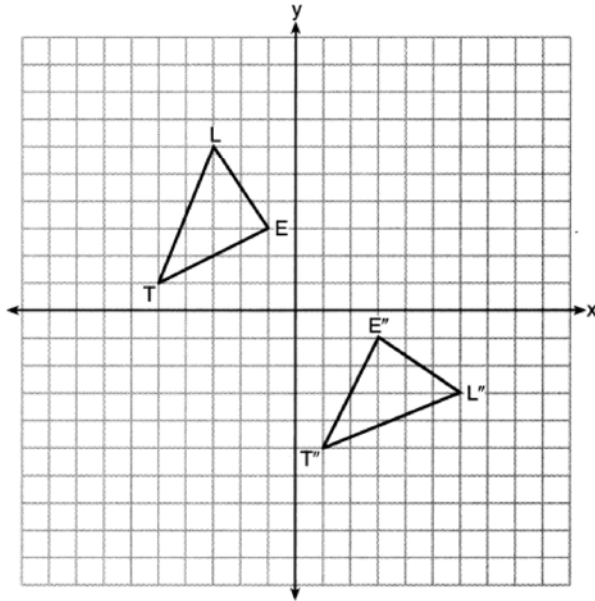
- 6 Triangles  $ABC$  and  $RST$  are graphed on the set of axes below.



Which sequence of rigid motions will prove  $\triangle ABC \cong \triangle RST$ ?

- 1) a line reflection over  $y = x$
- 2) a rotation of  $180^\circ$  centered at  $(1, 0)$
- 3) a line reflection over the  $x$ -axis followed by a translation of 6 units right
- 4) a line reflection over the  $x$ -axis followed by a line reflection over  $y = 1$

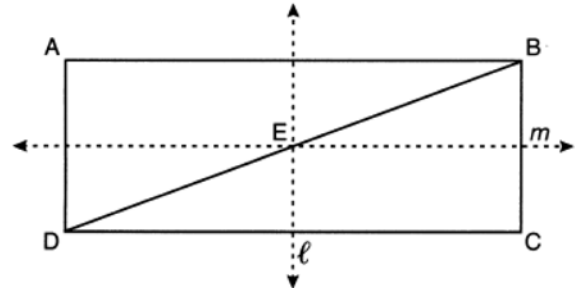
- 7 On the set of axes below,  $\triangle LET$  and  $\triangle L''E''T''$  are graphed in the coordinate plane where  $\triangle LET \cong \triangle L''E''T''$ .



Which sequence of rigid motions maps  $\triangle LET$  onto  $\triangle L''E''T''$ ?

- 1) a reflection over the  $y$ -axis followed by a reflection over the  $x$ -axis
- 2) a rotation of  $180^\circ$  about the origin
- 3) a rotation of  $90^\circ$  counterclockwise about the origin followed by a reflection over the  $y$ -axis
- 4) a reflection over the  $x$ -axis followed by a rotation of  $90^\circ$  clockwise about the origin

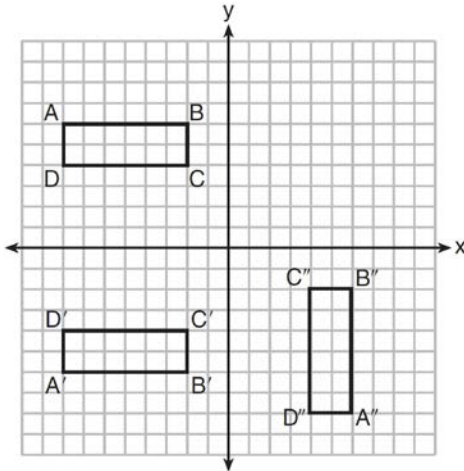
- 8 In the diagram below,  $ABCD$  is a rectangle, and diagonal  $\overline{BD}$  is drawn. Line  $\ell$ , a vertical line of symmetry, and line  $m$ , a horizontal line of symmetry, intersect at point  $E$ .



Which sequence of transformations will map  $\triangle ABD$  onto  $\triangle CDB$ ?

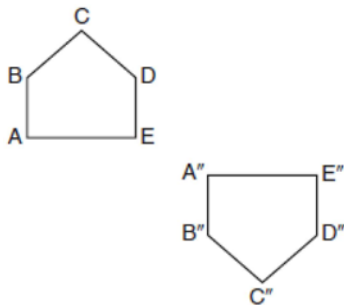
- 1) a reflection over line  $\ell$  followed by a  $180^\circ$  rotation about point  $E$
- 2) a reflection over line  $\ell$  followed by a reflection over line  $m$
- 3) a  $180^\circ$  rotation about point  $B$
- 4) a reflection over  $\overline{DB}$

- 9 A sequence of transformations maps rectangle  $ABCD$  onto rectangle  $A''B''C''D''$ , as shown in the diagram below.



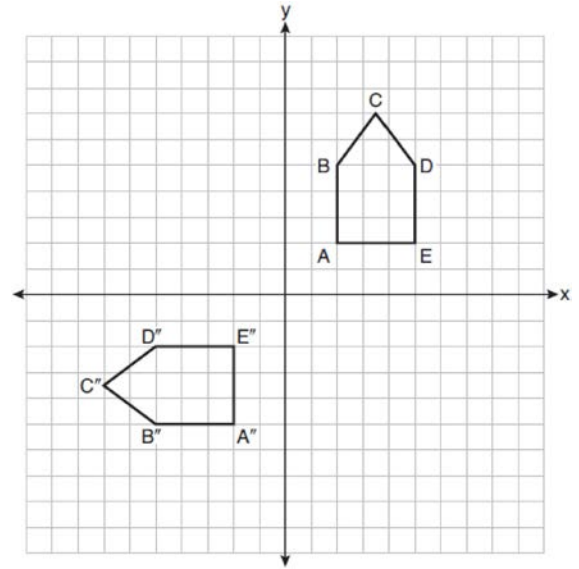
Which sequence of transformations maps  $ABCD$  onto  $A'B'C'D'$  and then maps  $A'B'C'D'$  onto  $A''B''C''D''$ ?

- 1) a reflection followed by a rotation
  - 2) a reflection followed by a translation
  - 3) a translation followed by a rotation
  - 4) a translation followed by a reflection
- 10 Identify which sequence of transformations could map pentagon  $ABCDE$  onto pentagon  $A''B''C''D''E''$ , as shown below.



- 1) dilation followed by a rotation
- 2) translation followed by a rotation
- 3) line reflection followed by a translation
- 4) line reflection followed by a line reflection

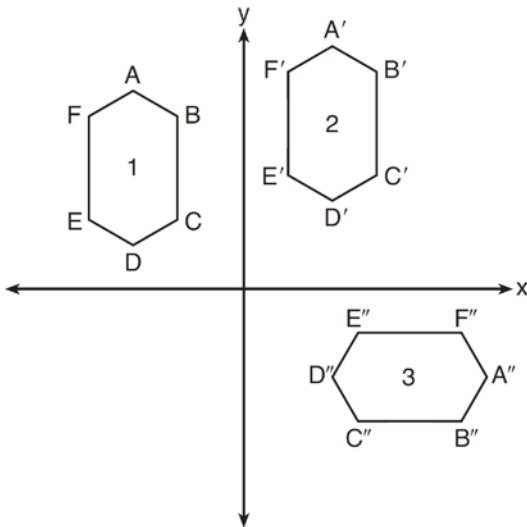
- 11 On the set of axes below, pentagon  $ABCDE$  is congruent to  $A''B''C''D''E''$ .



Which describes a sequence of rigid motions that maps  $ABCDE$  onto  $A''B''C''D''E''$ ?

- 1) a rotation of  $90^\circ$  counterclockwise about the origin followed by a reflection over the  $x$ -axis
- 2) a rotation of  $90^\circ$  counterclockwise about the origin followed by a translation down 7 units
- 3) a reflection over the  $y$ -axis followed by a reflection over the  $x$ -axis
- 4) a reflection over the  $x$ -axis followed by a rotation of  $90^\circ$  counterclockwise about the origin

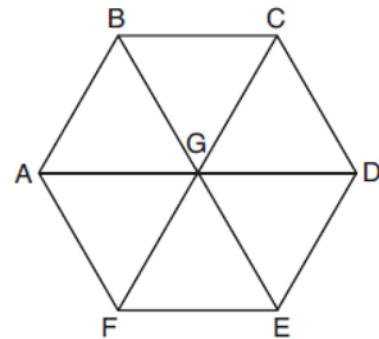
- 12 In the diagram below, congruent figures 1, 2, and 3 are drawn.



Which sequence of transformations maps figure 1 onto figure 2 and then figure 2 onto figure 3?

- 1) a reflection followed by a translation
- 2) a rotation followed by a translation
- 3) a translation followed by a reflection
- 4) a translation followed by a rotation

- 13 In regular hexagon  $ABCDEF$  shown below,  $\overline{AD}$ ,  $\overline{BE}$ , and  $\overline{CF}$  all intersect at  $G$ .



When  $\triangle ABG$  is reflected over  $\overline{BG}$  and then rotated  $180^\circ$  about point  $G$ ,  $\triangle ABG$  is mapped onto

- 1)  $\triangle FEG$
- 2)  $\triangle AFG$
- 3)  $\triangle CBG$
- 4)  $\triangle DEG$

**G.CO.A.5: Compositions of Transformations 1**  
**Answer Section**

- 1 ANS: 1 REF: 012022geo  
2 ANS: 4 REF: 061901geo  
3 ANS: 1 REF: 011608geo  
4 ANS: 1 REF: 062308geo  
5 ANS: 2 REF: 061701geo  
6 ANS: 2 REF: 081909geo  
7 ANS: 3

1) and 2) are wrong because the orientation of  $\triangle LET$  has changed, implying one reflection has occurred. The sequence in 4) moves  $\triangle LET$  back to Quadrant II.

REF: 062218geo

- 8 ANS: 2 REF: 082220geo  
9 ANS: 1 REF: 081507geo  
10 ANS: 3 REF: 011710geo  
11 ANS: 2 REF: 012017geo  
12 ANS: 4 REF: 061504geo  
13 ANS: 1 REF: 081804geo