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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° clockwise rotation centered at (0,0) followed by a reflection over the *x*-axis?

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

- Name: _____
- 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

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



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

- a reflection over the *x*-axis followed by a reflection over the *y*-axis
- 2) a 180° rotation about the origin followed by a reflection over the line y = x
- 3) a 90° clockwise rotation about the origin followed by a reflection over the *y*-axis
- a translation 8 units to the right and 1 unit up followed by a 90° 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.

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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° about the origin followed by a translation
- 4) a counterclockwise rotation of 90° about the origin followed by a translation

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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° centered at (1,0)
- 3) a line reflection over the *x*-axis followed by a translation of 6 units right
- a line reflection over the *x*-axis followed by a line reflection over y = 1

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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° about the origin
- 3) a rotation of 90° 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° clockwise about the origin

8 In the diagram below, *ABCD* is a rectangle, and diagonal \overline{BD} is drawn. Line ℓ , 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 ℓ followed by a 180° rotation about point *E*
- 2) a reflection over line ℓ followed by a reflection over line *m*
- 3) a 180° rotation about point B
- 4) a reflection over \overline{DB}

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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

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10 On the set of axes below, congruent parallelograms *ABCD* and *RSTU* are graphed.



Which sequence of transformations maps *ABCD* onto RSTU?

- 1) a reflection over the *x*-axis followed by a translation ten units to the left and one unit up
- 2) a translation four units down followed by a reflection over the *y*-axis
- 3) a reflection over the *y*-axis followed by a translation of two units down
- 4) a translation ten units to the left followed by a reflection over the *x*-axis
- 11 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

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12 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° counterclockwise about the origin followed by a reflection over the *x*-axis
- 2) a rotation of 90° counterclockwise about the origin followed by a translation down 7 units
- a reflection over the *y*-axis followed by a reflection over the *x*-axis
- a reflection over the x-axis followed by a rotation of 90° counterclockwise about the origin

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



When $\triangle ABG$ is reflected over BG and then rotated 180° about point G, $\triangle ABG$ is mapped onto

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

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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:	2	REF:	012503geo
11	ANS:	3	REF:	011710geo
12	ANS:	2	REF:	012017geo
13	ANS:	4	REF:	061504geo
14	ANS:	1	REF:	081804geo