G.G.58: Compositions of Transformations: Define, investigate, justify, and apply similarities (dilations and the composition of dilations and isometries)

1 The endpoints of $\overline{AB}$ are $A(3, 2)$ and $B(7, 1)$. If $A''B''$ is the result of the transformation of $AB$ under $D_2 \circ T_{-4, 3}$ what are the coordinates of $A''$ and $B''$?
   1) $A''(-2, 10)$ and $B''(6, 8)$
   2) $A''(-1, 5)$ and $B''(3, 4)$
   3) $A''(2, 7)$ and $B''(10, 5)$
   4) $A''(14, -2)$ and $B''(22, -4)$

2 As shown on the set of axes below, $\triangle GHS$ has vertices $G(3, 1)$, $H(5, 3)$, and $S(1, 4)$. Graph and state the coordinates of $\triangle G''H''S''$, the image of $\triangle GHS$ after the transformation $T_{-3, 1} \circ D_2$.

3 The coordinates of the vertices of $\triangle ABC$ $A(1, 3)$, $B(-2, 2)$ and $C(0, -2)$. On the grid below, graph and label $\triangle A''B''C''$, the result of the composite transformation $D_2 \circ T_{3, -2}$. State the coordinates of $A''$, $B''$, and $C''$. 
4. The vertices of \( \triangle RST \) are \( R(-6,5), S(-7,-2) \), and \( T(1,4) \). The image of \( \triangle RST \) after the composition \( T_{-2,3} \circ r_{y=x} \) is \( \triangle R"S"T" \). State the coordinates of \( \triangle R"S"T" \). [The use of the set of axes below is optional.]

5. Triangle \( ABC \) has vertices \( A(5,1), B(1,4) \) and \( C(1,1) \). State and label the coordinates of the vertices of \( \triangle A"B"C" \), the image of \( \triangle ABC \), following the composite transformation \( T_{1,-1} \circ D_2 \). [The use of the set of axes below is optional.]
6 The coordinates of trapezoid $ABCD$ are $A(-4, 5)$, $B(1, 5)$, $C(1, 2)$, and $D(-6, 2)$. Trapezoid $A''B''C''D''$ is the image after the composition $r_x \circ r_y$ is performed on trapezoid $ABCD$. State the coordinates of trapezoid $A''B''C''D''$. [The use of the set of axes below is optional.]

7 The coordinates of the vertices of parallelogram $SWAN$ are $S(2, -2)$, $W(-2, -4)$, $A(-4, 6)$, and $N(0, 8)$. State and label the coordinates of parallelogram $S''W''A''N''$, the image of $SWAN$ after the transformation $T_{4,-2} \circ D_{\frac{1}{2}}$. [The use of the set of axes below is optional.]
8 Quadrilateral MATH has coordinates M(−6, −3), A(−1, −3), T(−2, −1), and H(−4, −1). The image of quadrilateral MATH after the composition \( r_{x-axis} \circ T_{7,5} \) is quadrilateral M″A″T″H″. State and label the coordinates of M″A″T″H″. [The use of the set of axes below is optional.]

9 The coordinates of the vertices of \( \triangle ABC \) are A(−6, 5), B(−4, 8), and C(1, 6). State and label the coordinates of the vertices of \( \triangle A''B''C'' \), the image of \( \triangle ABC \) after the composition of transformations \( T_{(−4, 5)} \circ r_{y-axis} \). [The use of the set of axes below is optional.]
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Answer Section

1 ANS: 1
After the translation, the coordinates are $A'(-1,5)$ and $B'(3,4)$. After the dilation, the coordinates are $A''(-2,10)$ and $B''(6,8)$.

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2 ANS:

![Diagram](image1)

$G''(3,3), H''(7,7), S''(-1,9)$

REF: 081136ge

3 ANS:

![Diagram](image2)

$A''(8,2), B''(2,0), C''(6,-8)$

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4 ANS:

![Diagram](image3)

REF: 081236ge
5  ANS:

\[ A''(11, 1), B''(3, 7), C''(3, 1) \]

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6  ANS:

\[ A'(5, -4), B'(5, 1), C'(2, 1), D'(2, -6); A''(5, 4), B''(5, -1), C''(2, -1), D''(2, 6) \]

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7  ANS:

\[ S''(5, -3), W''(3, -4), A''(2, 1), \text{ and } N''(4, 2) \]

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8  ANS:

\[ M''(1, -2), A''(6, -2), T''(5, -4), H''(3, -4) \]

REF: 081336ge
9  ANS:

REF: 011436ge