Aim: What are compositions of transformations?

Do Now:

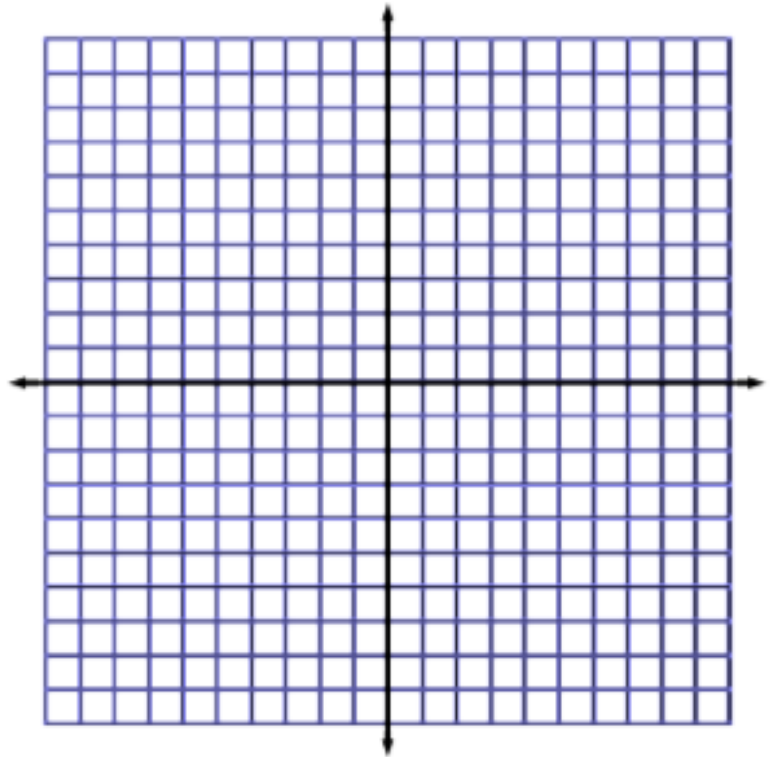1. Graph ΔABC:

A(5, 6) B(1, 2) C(2, 8)

2. $r_{y\text{-axis}}$ΔABC. Label it ΔA'B'C'

3. $R_{O, 90}$ Δ A'B'C'. Label it ΔA"B"C"

4. $T_{8, -4}$Δ A"B"C". Label it ΔA"'B"'C"'

Compositions of Transformations! What is that? Let's discuss.

$$R_{180°} \circ r_{x\text{-axis}}$$

1. Given point $A(-2, 3)$. State the coordinates of the image of A under the composition $T_{(-3,-4)} \circ r_{x\text{-axis}}$. [The use of the accompanying grid is optional.]
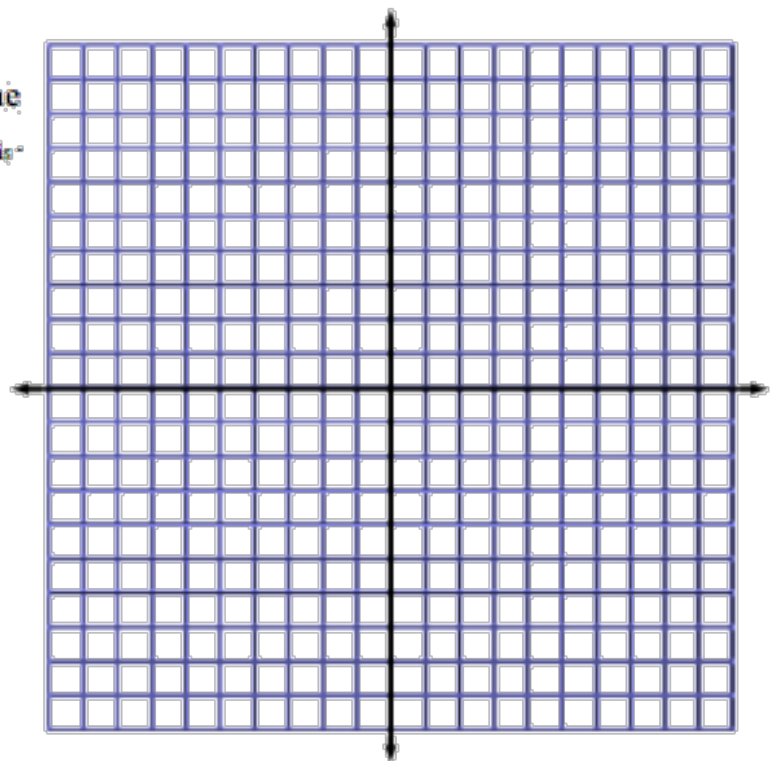
2. On the accompanying grid, graph and label $\overline{AB}$, where A is $(0,5)$ and B is $(2,0)$. Under the transformation $r_{x\text{-axis}} \circ r_{y\text{-axis}}(\overline{AB})$, A maps to A'', and B maps to B''. Graph and label $\overline{A''B''}$. What single transformation would map $\overline{AB}$ to $\overline{A''B''}$?
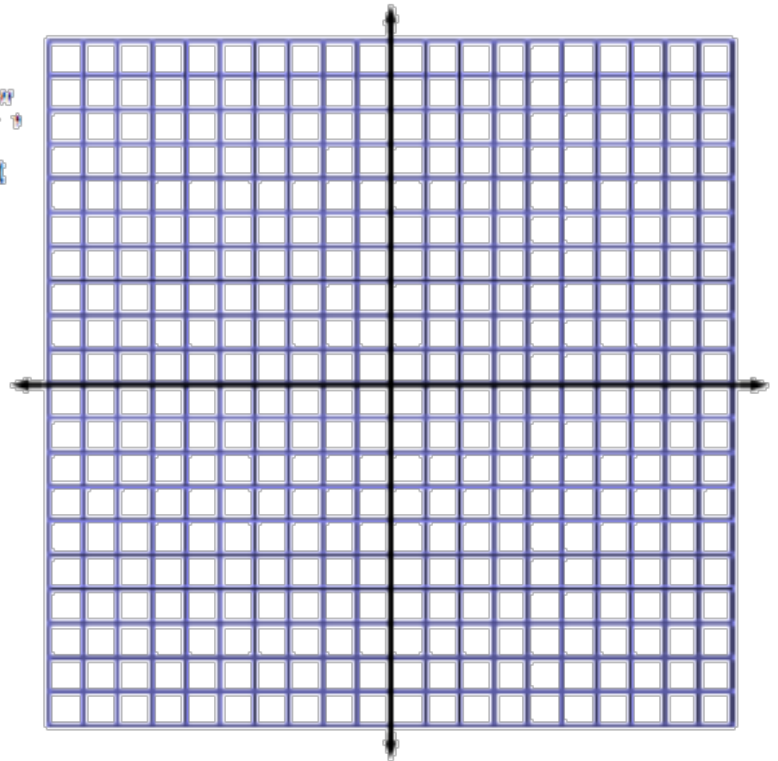
3. On the accompanying grid, graph and label $\triangle ABC$ with vertices $A(3,1)$, $B(0,4)$, and $C(-5,3)$. On the same grid, graph and label $\triangle A''B''C''$, the image of $\triangle ABC$ after the transformation $r_{x\text{-axis}} \circ r_{y=x}$.
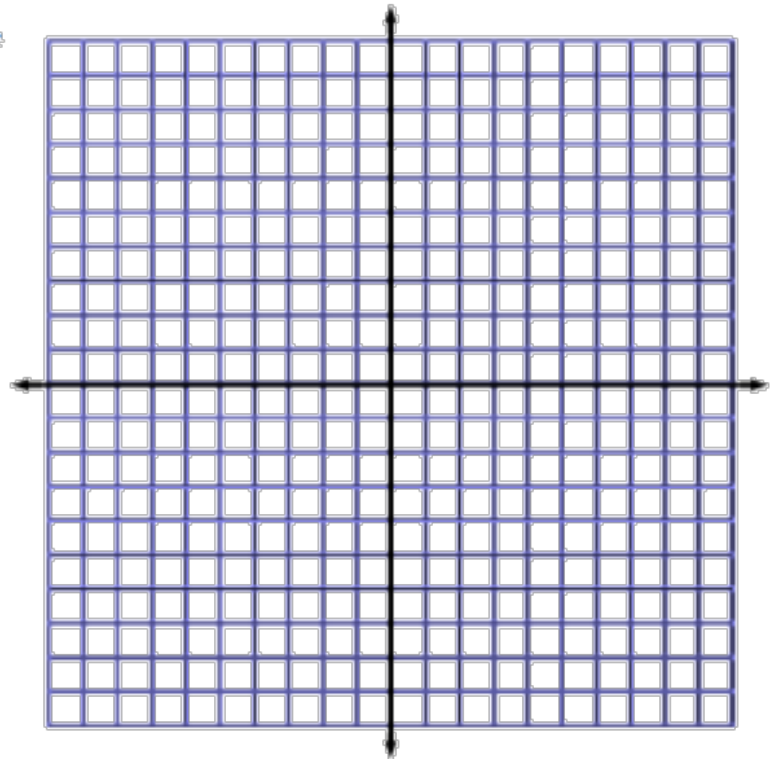
4. The coordinates of the vertices of $\triangle ABC$ are
   $A(1,6)$, $B(2,9)$, and $C(7,10)$.
   a On the graph below, draw and label $\triangle ABC$.
   b Graph and state the coordinates of $\triangle A'B'C'$,
   the image of $\triangle ABC$ after a reflection over the
   line $y = x$.
   c Graph and state the coordinates of $\triangle A''B''C''$,
   the image of $\triangle A'B'C'$ after a reflection in the
   x-axis.
   d Graph and state the coordinates of $\triangle A'''B'''C'''$,
   the image of $\triangle A''B''C''$ after the transformation
   $(x,y) \to (x-5, y+3)$.

   e. Write b-d as a composition of transformations
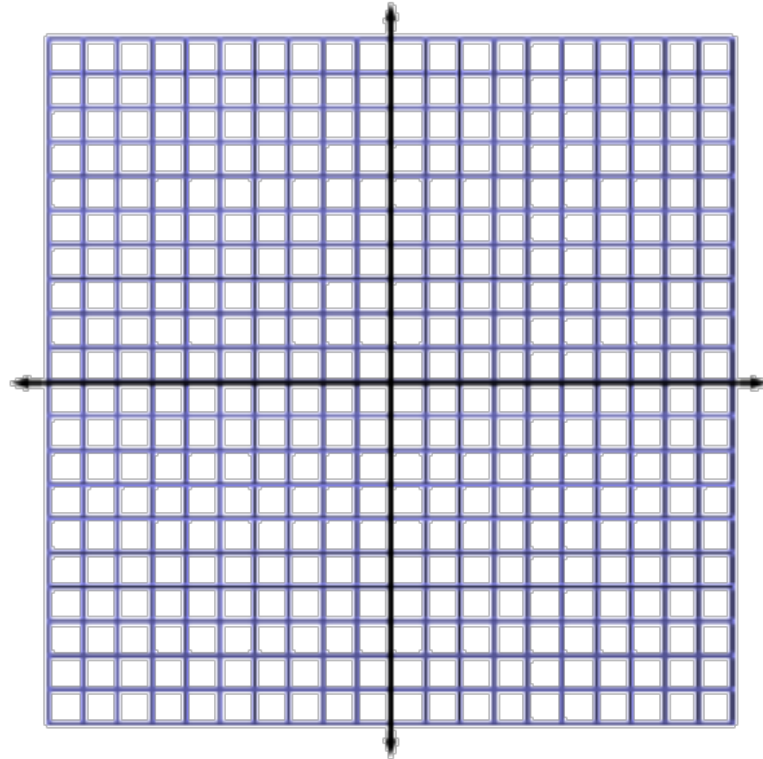
5. Triangle ABC has coordinates $A(-1,2)$, $B(6,2)$, and
   $C(3,4)$.
   a On the grid below, draw and label $\triangle ABC$.
   b Graph and state the coordinates of $\triangle A'B'C'$,
   the image of $\triangle ABC$ after the composition
   $R_{90°} \circ r_{x-axis}$.
   c Write a transformation equivalent to
   $R_{90°} \circ r_{x-axis}$.