7.4 Classwork: Compositions of multiple transformations   CCSS.HSG.CO.A.5
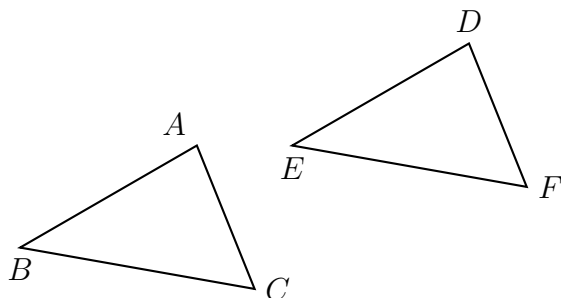
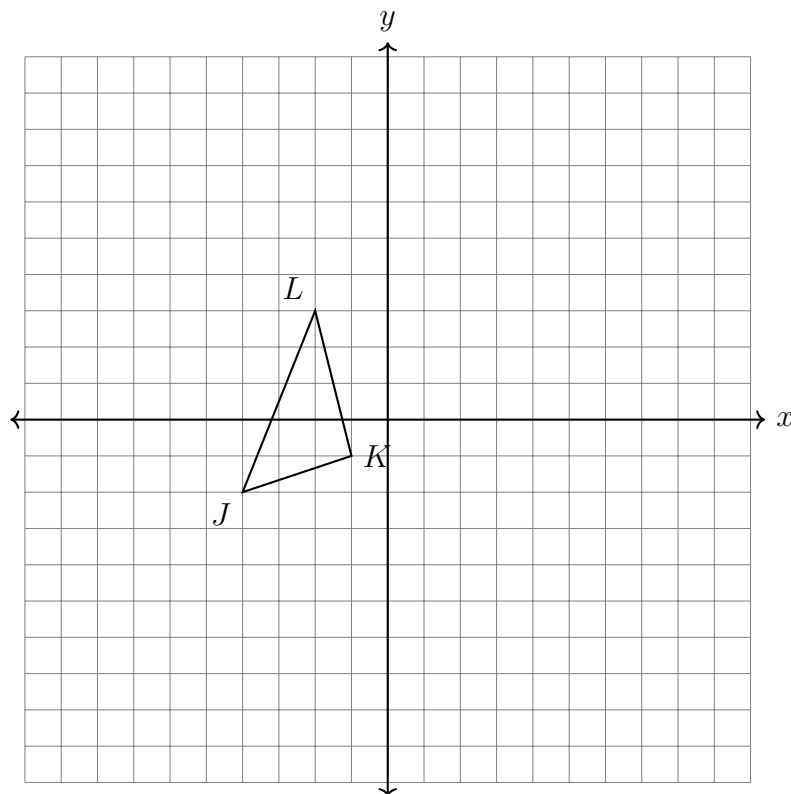1. A translation maps triangle ABC onto triangle DEF.

Fill in the blank with the corresponding object.

(a) $A \rightarrow$ _____

(b) $\angle ABC \cong$ _____

(c) _____ $\cong \overline{EF}$

2. The vertices of $\triangle JKL$ have the coordinates $J(-4,-2)$, $K(-1,-1)$, and $L(-2,3)$, as shown below.

Apply a translation of $(x,y) \rightarrow (x+7, y+4)$ to $\triangle JKL$ and then reflect the image across the x-axis. Draw both images $\triangle J'K'L'$ and $\triangle J''K''L''$ on the set of axes below, labeling the vertices.
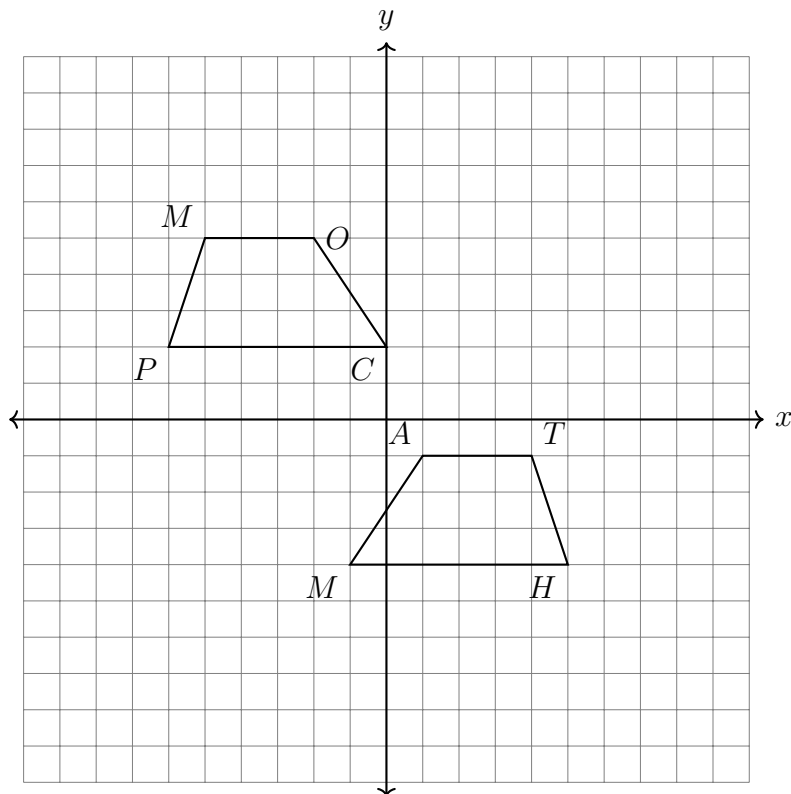
3. A rotation of 90° is applied to $\triangle ABC$, mapping it onto $\triangle PQR$, as shown.

   Which triangle has the larger area, or are they equal? Justify your answer.
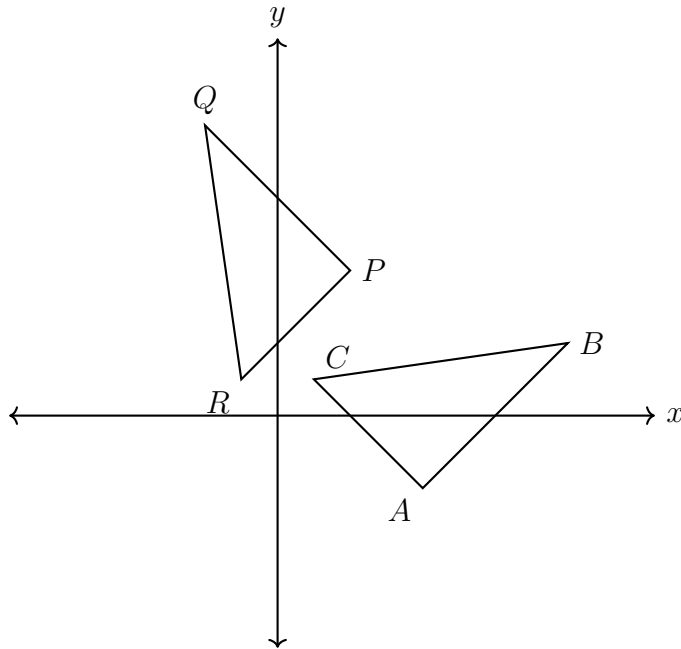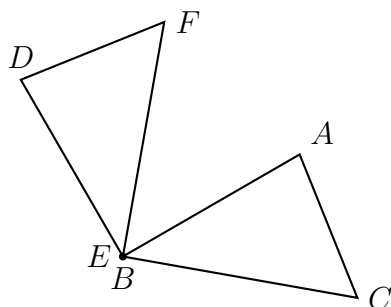

4. The trapezoid $MATH$, shown below, undergoes two rigid motions carrying it onto trapezoid $COMP$. State the two isometric transformations. (there is more than one correct answer)

5. A rotation of 90° around the vertex B of triangle ABC carries it onto triangle DEF.
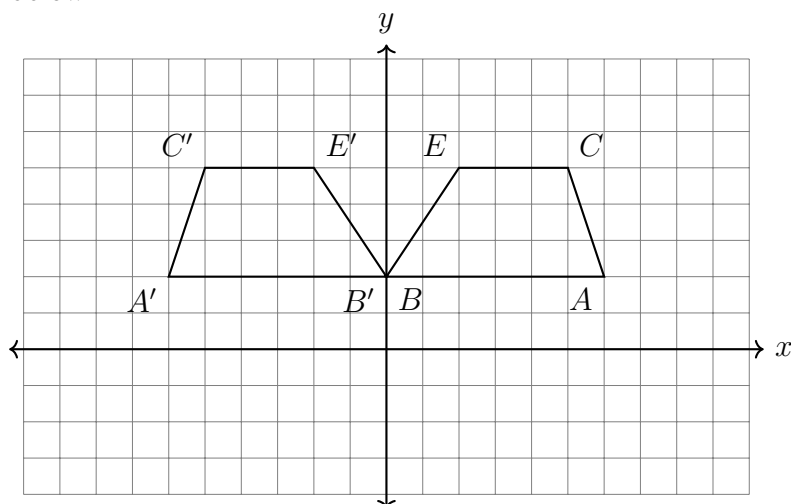
Fill in the blank with the corresponding object.

(a) $A \rightarrow$ _____

(b) $\angle ABC \cong$ _____

(c) _____ $\cong \overline{EF}$

6. State the transformation that carries the trapezoid $BECA$, onto $B'E'C'A'$, as shown below.

Note: For translations, you must state the x and y quantities; for reflections, the line of reflection; for rotations, the center of rotation and quantity in degrees.

7. Find the length of $\overline{AB}$, where $A(5, -6)$ and $B(13, 0)$.

8. The vertices of $\triangle JKL$ have the coordinates $J(-4, -2)$, $K(-5, 1)$, and $L(-2, 3)$, as shown below.

   Apply a translation of $(x, y) \rightarrow (x + 6, y - 7)$ to $\triangle JKL$ and then reflect the image across the y-axis. Draw both images $\triangle J'K'L'$ and $\triangle J''K''L''$ on the set of axes below, labeling the vertices.
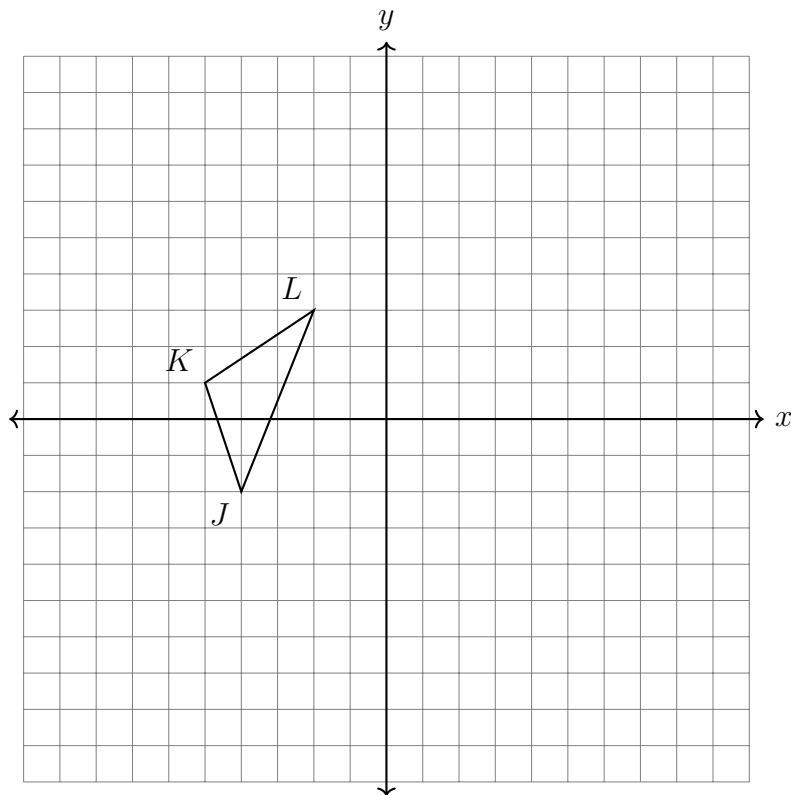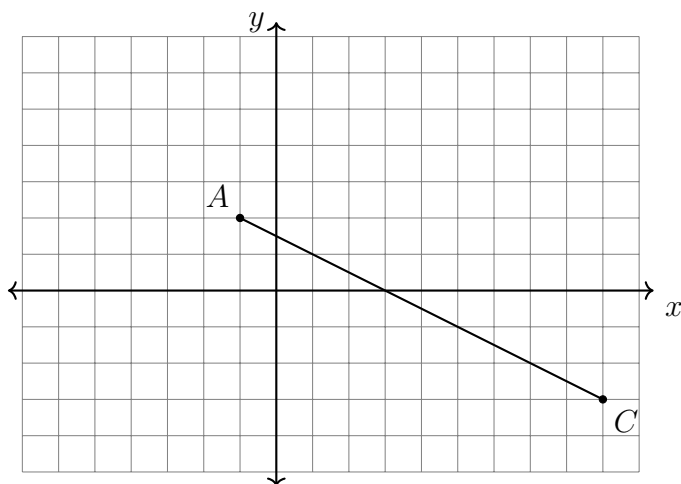

9. Challenge: Determine relationship of each equation to the line $y = \frac{4}{3}x - 4$, circling either parallel, perpendicular, or neither.

   (a) $4x - 3y = 6$ Parallel   Perpendicular   Neither

   (b) $3x + 4y = 5$ Parallel   Perpendicular   Neither

10. In the diagram below, $\overleftrightarrow{AC}$ has endpoints with coordinates $A(-1, 2)$ and $C(9, -3)$.

If B is a point on $\overline{AC}$ and $AB{:}BC = 2{:}3$, what are the coordinates of B?