Module 10d: Rigid Motion Transformations & Congruence

Math Practice(s):

-Model with mathematics.

-Use appropriate tools strategically.

Learning Target(s):

- Define congruence in terms of rigid motion transformations.
- Perform a specified sequence of translations, reflections, and/or rotations on various plane figures.

Homework:

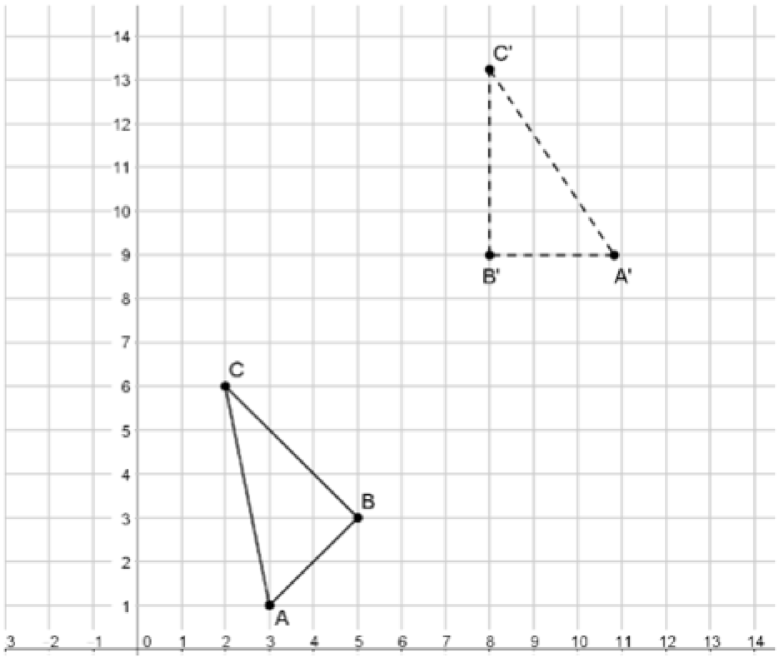
HW#7: 10d #1-4

Nov 20-12:32 PM

Warm-up

In the coordinate plane below, $\Delta ABC \cong \Delta A'B'C'$.

- Use patty paper to copy ΔABC and perform multiple transformations on ΔABC until it lands directly on $\Delta A'B'C'$.
- In the table that follows, list the order of the transformations you performed and briefly describe the transformation you performed.
  - For example, if you performed a rotation, you should state, "Rotated ΔABC counterclockwise about point C," or, "Reflected ΔABC about $\overline{AC}$."



Answers vary. Sample below.

Transformation Performed	Description of Transformation
Translation	$T(x,y) = (x+3, y+6)$
Rotation	45° clockwise about (8,9)
Reflection	over $x=8$ ($\overleftrightarrow{B'C'}$)

Congruence

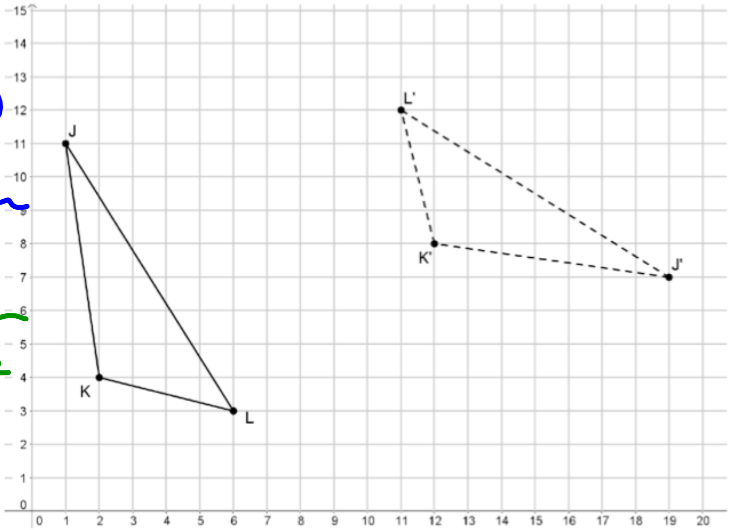
(Definition #2)

Figure A is said to be **congruent** to Figure B if and only if there is a sequence of rigid motion transformations that moves Figure A onto Figure B.

Example 1:
In the coordinate plane below, $\Delta JKL \cong \Delta J'K'L'$. Create TWO different sequences of rigid transformations that moves ΔJKL onto $\Delta J'K'L'$.

- Translate $T(x,y) = (x+10, y+4)$
- Rotate 90° clockwise about (12, 8)

- Rotate 90° clockwise about (6, 3)
- Translate $T(x,y) = (x+5, y+1)$
- Reflect over $y = 8$

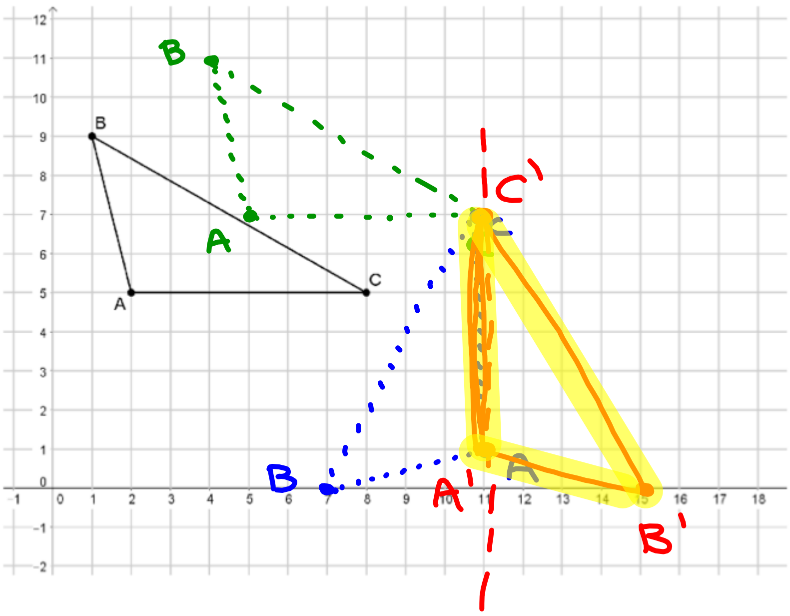


Practice

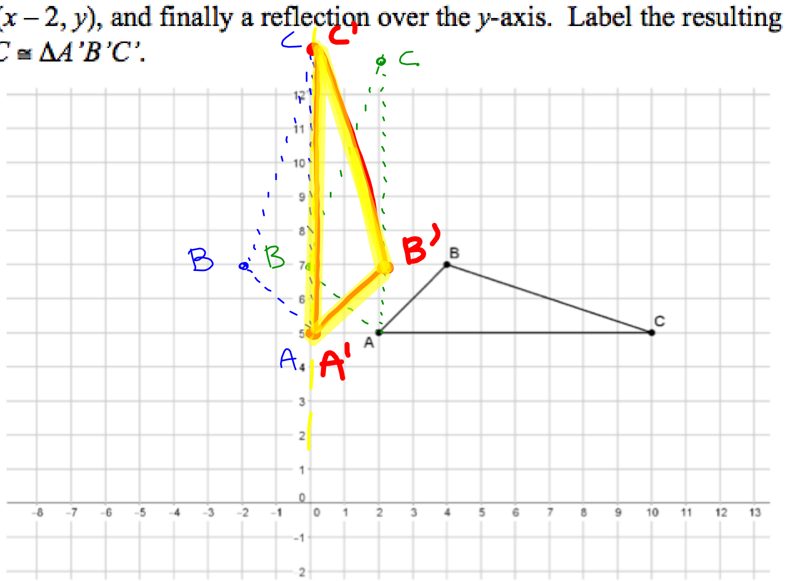
1. Draw the image of ΔABC below resulting from applying the transformations T, R, and F (in that order) defined as the following:

   - T is the translation defined by T(x, y) = ($x + 3$, $y + 2$)
   - R is a rotation of 90° counterclockwise about the point (11, 7)
   - F is a reflection over line $x = 11$

   Label the resulting image $\Delta A'B'C'$ such that $\Delta ABC \cong \Delta A'B'C'$.



2. Rotate ΔABC 90° counterclockwise about point A, followed by the translation, T, defined by $T(x, y) = (x - 2, y)$, and finally a reflection over the y-axis. Label the resulting image $\Delta A'B'C'$ such that $\Delta ABC \cong \Delta A'B'C'$.



3. Show that $\Delta ABC \cong \Delta A'B'C'$ by defining a sequence rigid motion transformations that moves ΔABC to $\Delta A'B'C'$.

Answers vary.
Sample below.

- Translate $T(x,y) = (x+7, y-1)$
- Rotate 90° counter-clockwise about (11,6)
- Reflect over $y=6$