Module 12a: Corresponding Parts of Congruent Triangles

Math Practice(s):

-Reason abstractly & quantitatively.

-Construct viable arguments & critique the reasoning of others.

Learning Target(s):

-Use the definition of congruence in terms of rigid motion to show two triangles are congruent **iff** (if and only if) corresponding pairs of sides & angles are congruent.

Homework:

HW#10: 12a #1-2

Nov 20-12:32 PM

1. State the three types of rigid motion transformations that can be used to show that two figures are **CONGRUENT**.

translation, rotation, reflection

2. Briefly explain the difference between a rigid motion transformation and a ***similarity*** transformation.

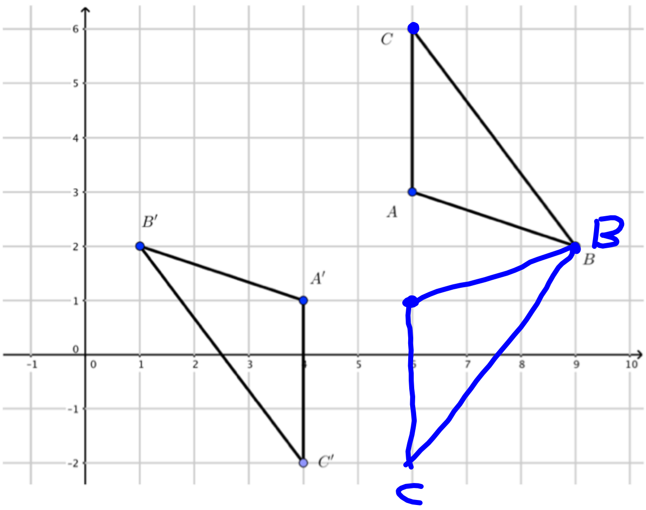
Similarity transformation uses dilations

3. The coordinate plane below shows two congruent triangles such that $\Delta ABC \cong \Delta A'B'C'$. Describe a rigid motion transformation that takes ΔABC to $\Delta A'B'C'$.

$T(x,y) = (x-2, y+2)$

Rotate 180° about A'

- Reflect over $y=2$
- Reflected over $x=5$



4. In the figure to the right, $\overline{BE} \perp \overline{RE}$.

A. Determine the length of $\overline{BE}$.

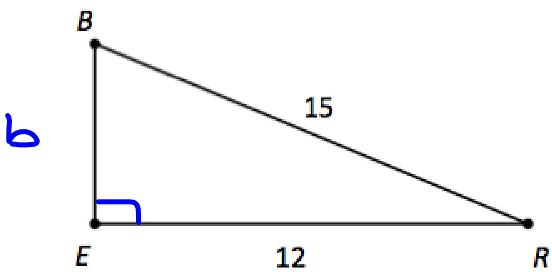
$12^2 + b^2 = 15^2$

$\boxed{BE = 9 \text{ units}}$

B. Determine the measure of $\angle R$.

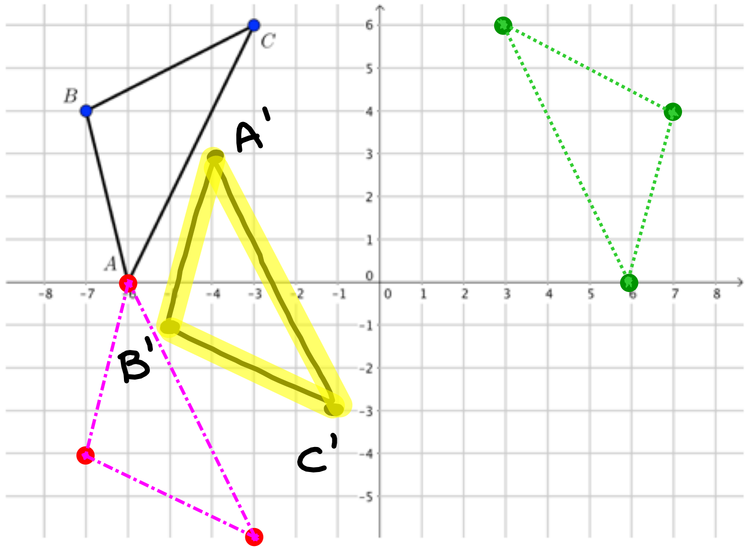
$\tan^{-1}\left(\frac{9}{12}\right) = m\angle R$

$\boxed{m\angle R = 37°}$



Perform the rigid motion transformations described below such that after completing all three transformations, $\Delta ABC \cong \Delta A'B'C'$.

- Reflect ΔABC about the y-axis.
- Rotate by 180° about the origin.
- Translate via $T(x, y) = (x + 2, y + 3)$.



Corresponding Parts of Congruent Triangles are Congruent (CPCTC)

If two triangles are congruent, then their six corresponding parts (their 3 angle pairs and their 3 side pairs) must also be $\cong$.

In other words, …

If $\Delta ABC \cong \Delta A'B'C'$, then

- Corresponding sides must be congruent:

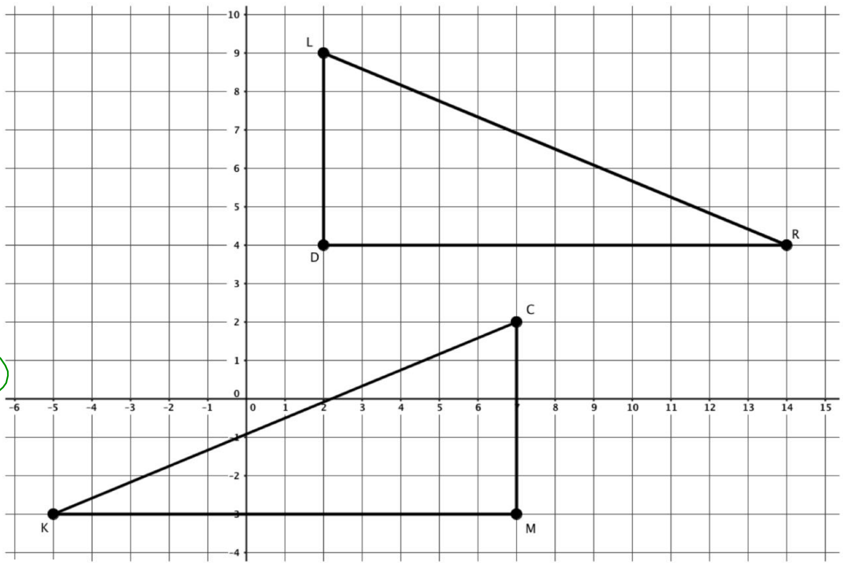
$\overline{AB} \cong \overline{A'B'}$, $\overline{BC} \cong \overline{B'C'}$, $\overline{AC} \cong \overline{A'C'}$

- Corresponding angles must be congruent:

$\angle A \cong \angle A'$, $\angle B \cong \angle B'$, $\angle C \cong \angle C'$

Practice

1. In the coordinate plane, $\overline{LD} \perp \overline{RD}$ and $\Delta LRD \cong \Delta CKM$.



A. Describe a rigid motion transformation that could be performed to show that $\Delta LRD \cong \Delta CKM$.

- Translate ΔLRD $T(x,y)=(x-5, y+7)$
- Reflect over $x=2$.

B. List all 6 pairs of congruent parts.

$\angle L \cong \angle C$ $\quad \overline{LR} \cong \overline{CK}$ $\quad \overline{LD} \cong \overline{CM}$

$\angle R \cong \angle K$ $\quad \overline{RD} \cong \overline{KM}$

$\angle D \cong \angle M$

C. Given that $m\angle K = 23°$, determine the measures of all angles of both triangles.

$m\angle D = 90°$ $\quad m\angle L = 67°$ $\quad m\angle R = 23°$

$m\angle M = 90°$ $\quad m\angle C = 67°$