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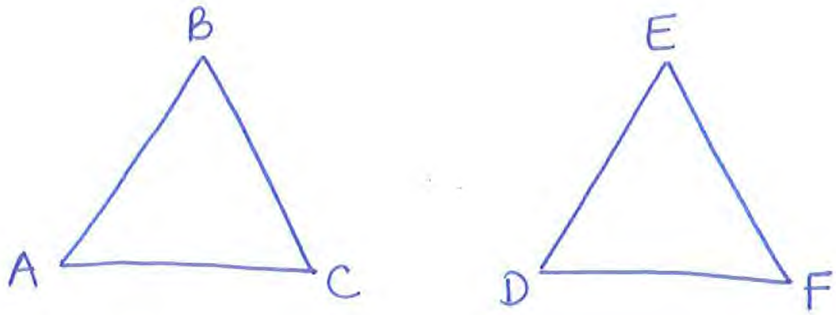
Rigid Motions and Congruence

The Basic Definition of Congruence:
Two figures are **congruent** if they have the same size and shape.

The More Formal Mathematical Definition of Congruence:
Two plane figures are **congruent** if and only if one figure can be obtained from the other figure by a sequence of rigid motions (translations, reflections, rotations).

Two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.



$\triangle ABC \cong \triangle DEF$ so...

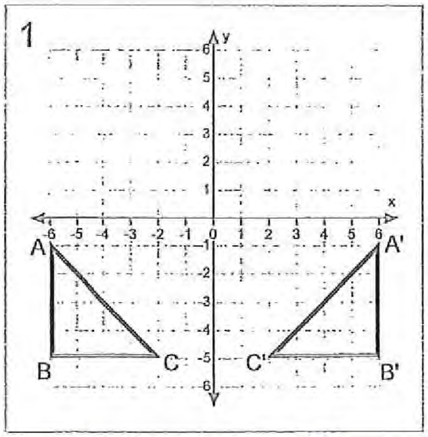
$\overline{AB} \cong \overline{DE}$	$\angle ABC \cong \angle DEF$
$\overline{BC} \cong \overline{EF}$	$\angle BAC \cong \angle EDF$
$\overline{AC} \cong \overline{DF}$	$\angle BCA \cong \angle EFD$

EXAMPLES

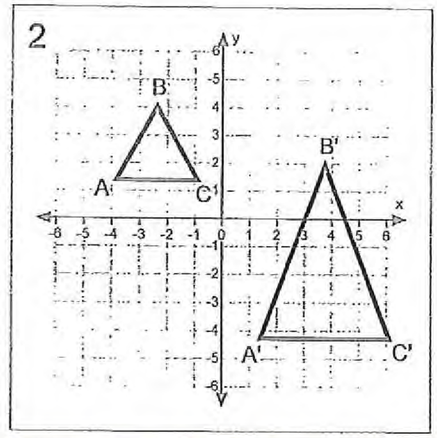
A) Are the two figures congruent?

B) If yes, tell what sequence of rigid motions took place to create the second figure.

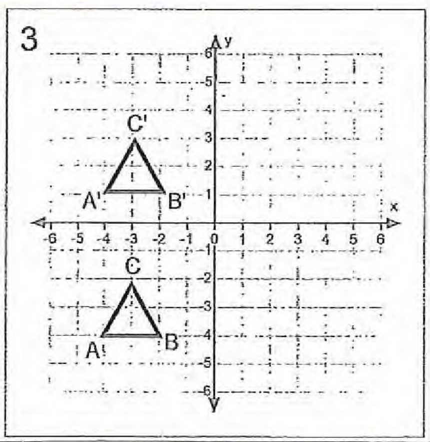
C) If no, explain why not.



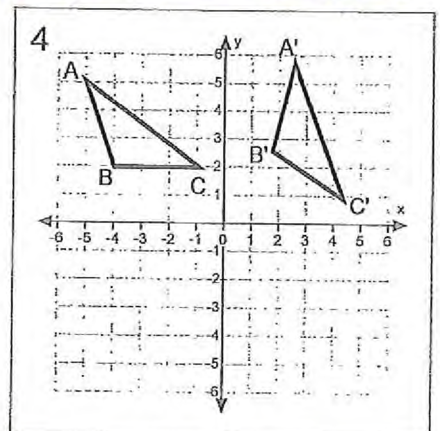
Yes, because $\triangle ABC$ was reflected across the y-axis to create $\triangle A'B'C'$.



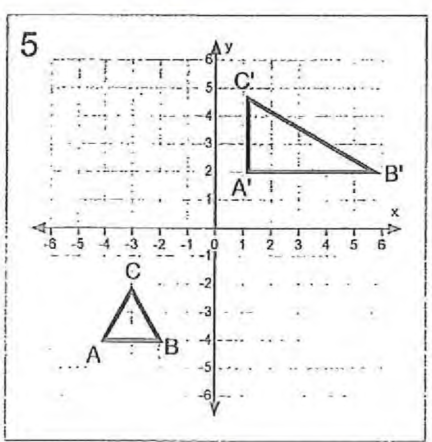
No, because there is no sequence of rigid motions that will create $\triangle A'B'C'$ from $\triangle ABC$.



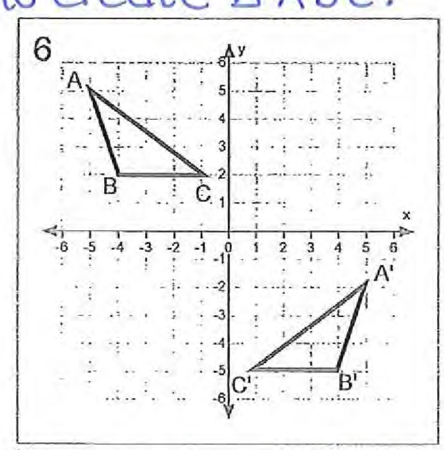
Yes, because $\triangle ABC$ was translated up to create $\triangle A'B'C'$.



Yes, because $\triangle ABC$ was translated right and rotated to create $\triangle A'B'C'$.



No, because there is no sequence of rigid motions that will create $\triangle A'B'C'$ from $\triangle ABC$.



Yes, because $\triangle ABC$ was reflected across the y-axis and translated down to create $\triangle A'B'C'$.