

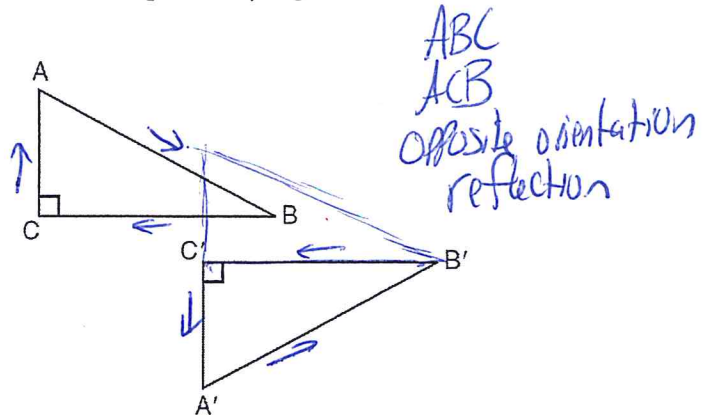
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Date \_\_\_\_\_  
Geometry

## Sequences of Rigid Motions Off the Grid

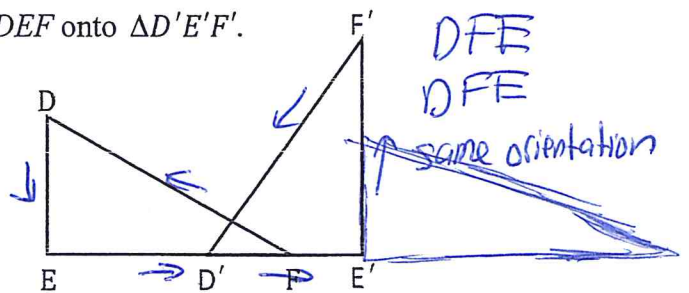
1. The diagram below shows  $\triangle ABC$  and  $\triangle A'B'C'$ . Describe a sequence of rigid motions that maps  $\triangle ABC$  onto  $\triangle A'B'C'$ .

1) translate  $\overline{CB}$  to  $\overline{C'B'}$  followed by reflect  $\triangle ABC$  over  $\overline{CB}$



2. Describe a sequence of rigid motions that maps  $\triangle DEF$  onto  $\triangle D'E'F'$ .

1) translate  $E$  to  $E'$  followed by rotate  $\triangle DEF$  about point  $E'$  until it maps onto  $\triangle D'E'F'$



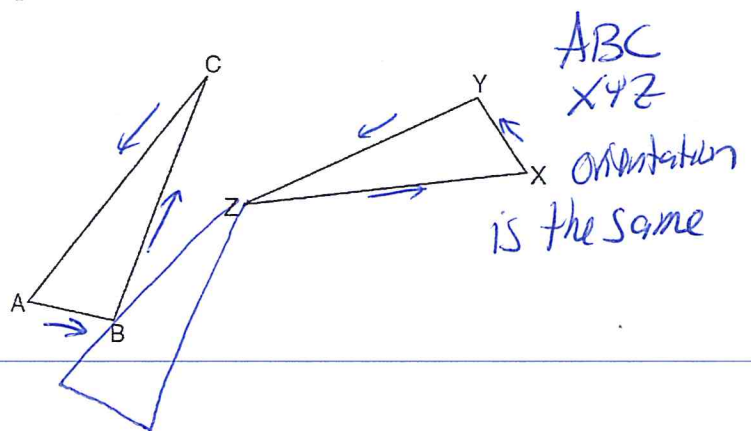
Justify that  $\triangle DEF \cong \triangle D'E'F'$ .

2) A translation and rotation are rigid motions

3) A rigid motion preserves size and angle measure producing a congruent figure

3. Describe a sequence of rigid motions that will map  $\triangle ABC$  onto  $\triangle XYZ$ .

1) translate  $C$  to  $Z$  followed by rotate  $\triangle ABC$  about point  $C$  until it maps onto  $\triangle XYZ$

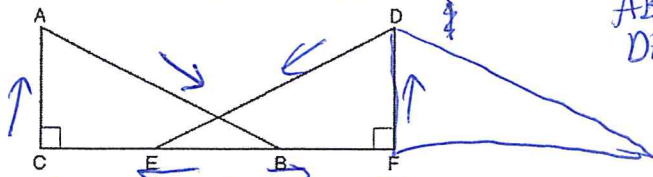


Is  $\triangle ABC \cong \triangle XYZ$ ? Justify your answer.

2) A translation and rotation are rigid motions

3) A rigid motion preserves size and angle measure producing a congruent figure.

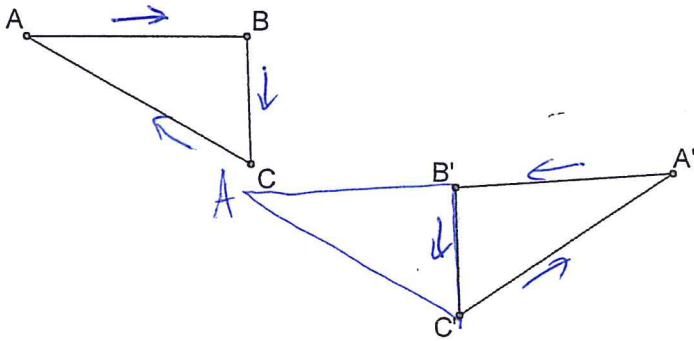
4. Given right triangles  $ABC$  and  $DEF$ . Describe a precise sequence of rigid motions which would show  $\triangle ABC \cong \triangle DEF$ .



$ABC$   
 $DFE$  opposite orientation

- 1) translate  $AC$  to  $DF$
- 2) reflect  $\triangle ABC$  over  $DF$

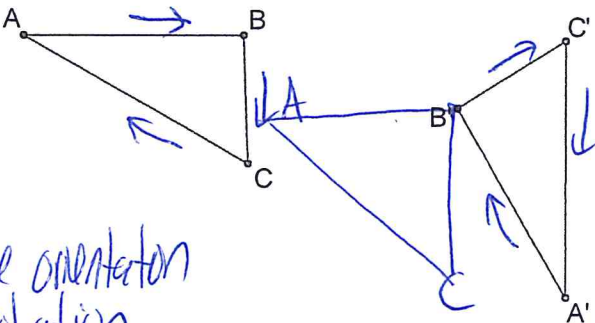
5. Prove that  $\triangle ABC \cong \triangle A'B'C'$  using rigid motions.



opposite orientation  
reflection

- 1) Translate  $BC$  to  $B'C'$  followed by reflect  $\triangle ABC$  over  $BC$
- 2) A translation and reflection are rigid motions
- 3) A rigid motion preserves size and angle measure producing a congruent figure.

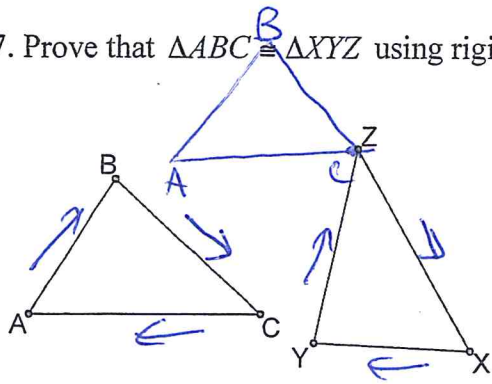
6. Prove that  $\triangle ABC \cong \triangle A'B'C'$  using rigid motions.



Same orientation  
rotation

- 1) Translate  $B$  to  $B'$  followed by rotating  $\triangle ABC$  about point  $B$  until it maps onto  $\triangle A'B'C'$
- 2) A translation and rotation are rigid motions
- 3) A rigid motion preserves size and angle measure producing a congruent figure.

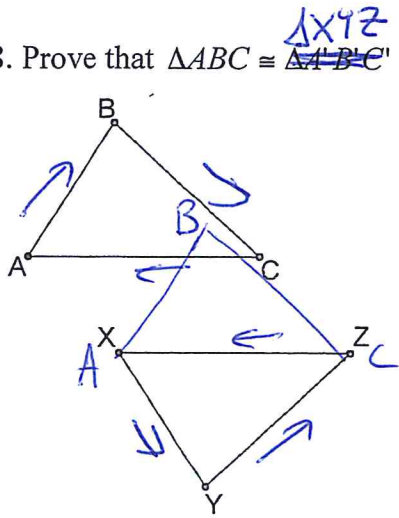
7. Prove that  $\triangle ABC \cong \triangle XYZ$  using rigid motions.



Same orientation  
rotation

- 1) translate C to Z followed by rotating  $\triangle ABC$  about C until it maps onto  $\triangle XYZ$
- 2) A translation and rotation are rigid motions.
- 3) A rigid motion preserves size and angle measure producing a congruent figure

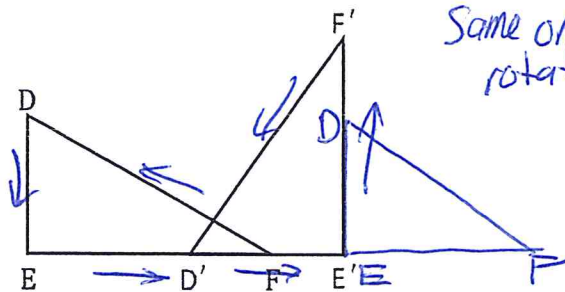
8. Prove that  $\triangle ABC \cong \triangle XYZ$  using rigid motions.



opposite orientation  
reflection

- 1) translate  $\overline{AC}$  to  $\overline{XZ}$  followed by reflecting  $\triangle ABC$  over  $\overline{XZ}$
- 2) A translation and reflection are rigid motions.
- 3) A rigid motion preserves size and angle measure producing a congruent figure.

9. Describe a sequence of rigid motions that maps  $\triangle DEF$  onto  $\triangle D'E'F'$ .



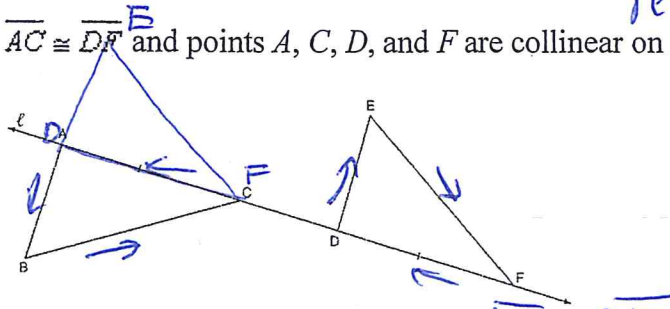
Same orientation  
rotation

Justify that  $\triangle DEF \cong \triangle D'E'F'$ .

- 1) translate E to E' followed by rotating  $\triangle DEF$  about E until it maps onto  $\triangle D'E'F'$
- 2) A translation and rotation are rigid motions.
- 3) A rigid motion preserves size and angle measure producing a congruent figure.

opposite orientation reflection.

10. In the diagram below,  $\overline{AC} \cong \overline{DF}$  and points  $A, C, D,$  and  $F$  are collinear on line  $\ell$ .

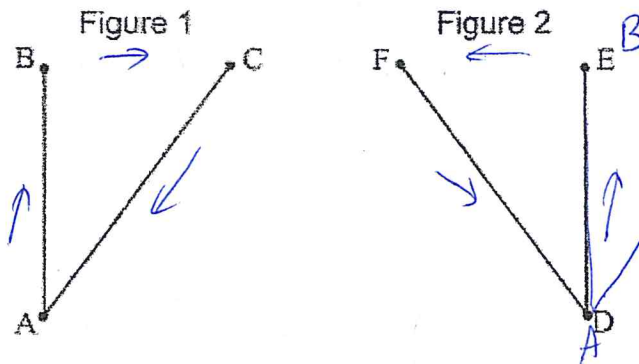


Let  $\triangle D'E'F'$  be the image of  $\triangle DEF$  after a translation along  $\ell$ , such that point  $D$  is mapped onto point  $A$ . Determine and state the location of  $F'$ . Explain your answer. Let  $\triangle D''E''F''$  be the image of  $\triangle D'E'F'$  after a reflection across line  $\ell$ . Suppose that  $E''$  is located at  $B$ . Is  $\triangle DEF$  congruent to  $\triangle ABC$ ? Explain your answer.

- 2) Yes, a translation and reflection are rigid motions.
- 3) A rigid motion preserves size and angle measure producing a congruent figure.

11. In the diagram below,  $m\angle A \cong m\angle D$ ,  $\overline{DE} \cong \overline{AB}$ ,  $\overline{DF} \cong \overline{AC}$ , and  $\overline{AB} \parallel \overline{DE}$ .

a) Construct and apply one or more rigid motions that maps Figure 1 to Figure 2.



opposite orientation reflection  
 1) translate  $\overline{AB}$  to  $\overline{DE}$  followed by reflecting figure 1 over  $\overline{ED}$

b) If  $\overline{BC}$  and  $\overline{FE}$  are drawn, would  $\triangle ABC$  and  $\triangle DEF$  be congruent? Justify your answer.

- 2) Yes, a translation and reflection are rigid motions.
- 3) A rigid motion preserves size and angle measure producing a congruent figure