## Lesson 7: No Bending or Stretching

Let’s compare measurements before and after translations, rotations, and reflections.

### 7.1: Measuring Segments

For each question, the unit is represented by the large tick marks with whole numbers.

1. Find the length of this segment to the nearest $\frac{1}{8}$ of a unit.
* 
1. Find the length of this segment to the nearest 0.1 of a unit.
* 
1. Estimate the length of this segment to the nearest $\frac{1}{8}$ of a unit.
* 
1. Estimate the length of the segment in the prior question to the nearest 0.1 of a unit.

### 7.2: Sides and Angles

1. Translate Polygon $A$ so point $P$ goes to point $Q$. In the image, write the length of each side, in grid units, next to the side.
* 
1. Rotate Triangle $B$ 90 degrees clockwise using $R$ as the center of rotation. In the image, write the measure of each angle in its interior.
* 
*
1. Reflect Pentagon $C$ across line $ℓ$.
	1. In the image, write the length of each side, in grid units, next to the side. You may need to make your own ruler with tracing paper or a blank index card.
	2. In the image, write the measure of each angle in the interior.
* 

### 7.3: Which One?

Here is a grid showing triangle $ABC$ and two other triangles.



You can use a **rigid transformation** to take triangle $ABC$ to *one* of the other triangles.

1. Which one? Explain how you know.
2. Describe a rigid transformation that takes $ABC$ to the triangle you selected.

#### Are you ready for more?

A square is made up of an L-shaped region and three transformations of the region. If the perimeter of the square is 40 units, what is the perimeter of each L-shaped region?



### Lesson 7 Summary

The transformations we’ve learned about so far, translations, rotations, reflections, and sequences of these motions, are all examples of **rigid transformations**. A rigid transformation is a move that doesn’t change measurements on any figure.

Earlier, we learned that a figure and its image have corresponding points. With a rigid transformation, figures like polygons also have **corresponding** sides and corresponding angles. These corresponding parts have the same measurements.

For example, triangle $EFD$ was made by reflecting triangle $ABC$ across a horizontal line, then translating. Corresponding sides have the same lengths, and corresponding angles have the same measures.



| measurements in triangle $ABC$ | corresponding measurements in image $EFD$ |
| --- | --- |
| $AB=2.24$ | $EF=2.24$ |
| $BC=2.83$ | $FD=2.83$ |
| $CA=3.00$ | $DE=3.00$ |
| $m∠ABC=71.6^{∘}$ | $m∠EFD=71.6^{∘}$ |
| $m∠BCA=45.0^{∘}$ | $m∠FDE=45.0^{∘}$ |
| $m∠CAB=63.4^{∘}$ | $m∠DEF=63.4^{∘}$ |



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