

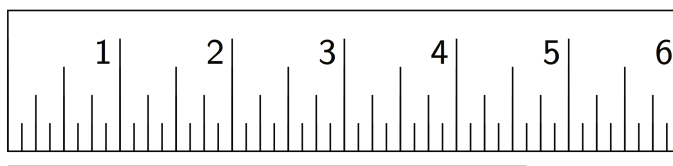
# Lesson 6: No Bending or Stretching

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

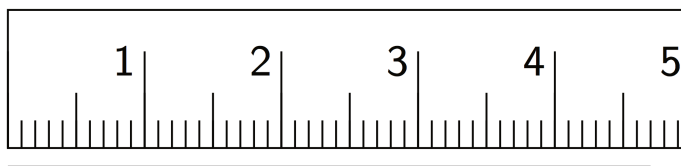
## 6.1: Measuring Segments

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

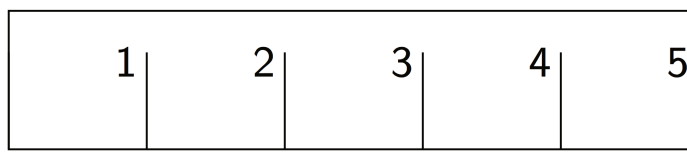
- Find the length of this segment to the nearest  $\frac{1}{8}$  of a unit.



- Find the length of this segment to the nearest 0.1 of a unit.



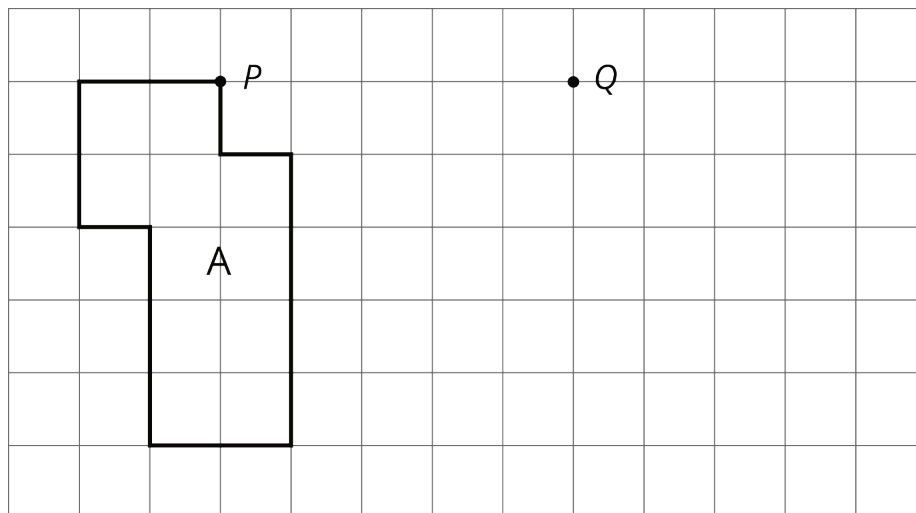
- Estimate the length of this segment to the nearest  $\frac{1}{8}$  of a unit.



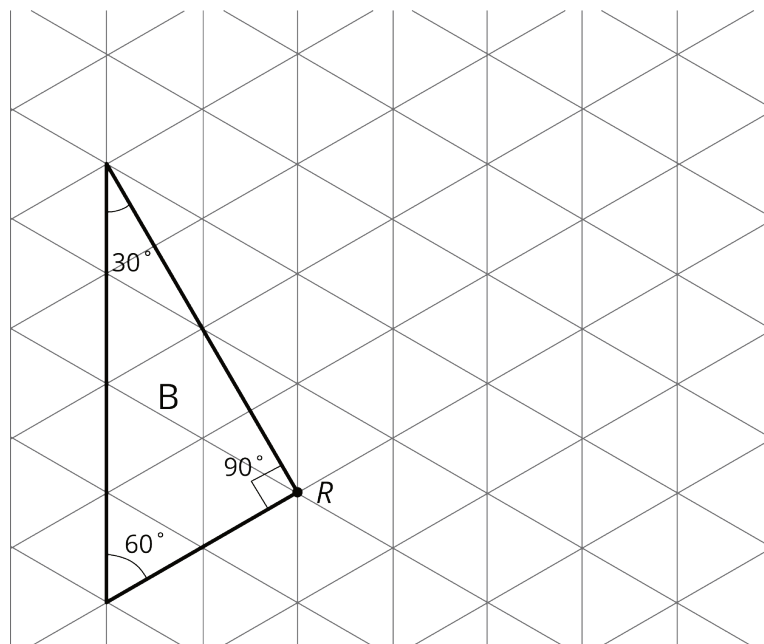
- Estimate the length of the segment in the prior question to the nearest 0.1 of a unit.

## 6.2: 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.



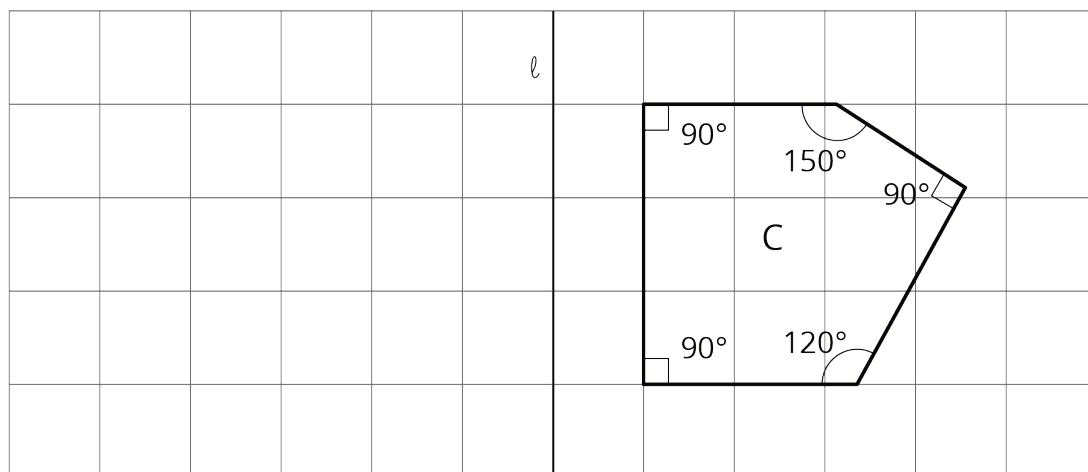
2. Rotate Triangle  $B$  90 degrees clockwise using  $R$  as the center of rotation. In the image, write the measure of each angle in its interior.



3. Reflect Pentagon  $C$  across line  $\ell$ .

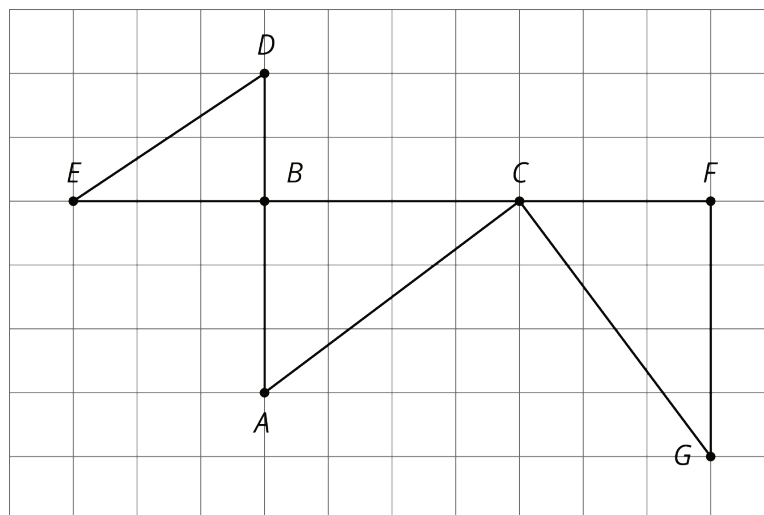
a. In the image, write the length of each side, in grid units, next to the side. You may need to make your own ruler with tracing paper or a blank index card.

b. In the image, write the measure of each angle in the interior.



## 6.3: 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.

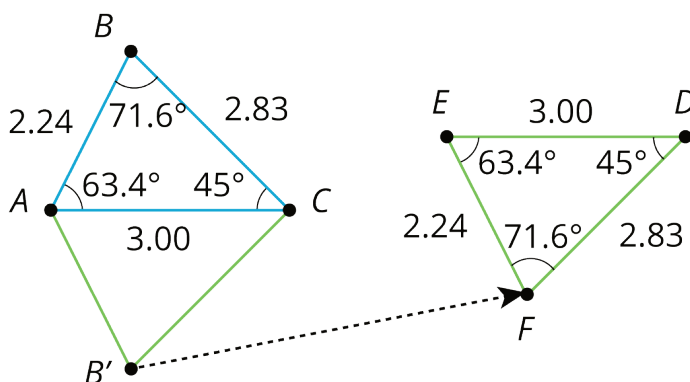
2. Describe a rigid transformation that takes  $ABC$  to the triangle you selected.

## Lesson 6 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 $EFD$
$AB = 2.24$	$EF = 2.24$
$BC = 2.83$	$FD = 2.83$
$CA = 3.00$	$DE = 3.00$
$m\angle ABC = 71.6^\circ$	$m\angle EFD = 71.6^\circ$
$m\angle BCA = 45.0^\circ$	$m\angle FDE = 45.0^\circ$
$m\angle CAB = 63.4^\circ$	$m\angle DEF = 63.4^\circ$