Unit 1, Lesson 7

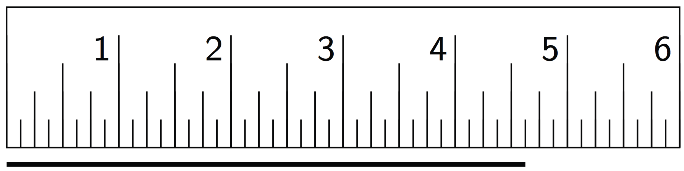
No Bending or Stretching

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

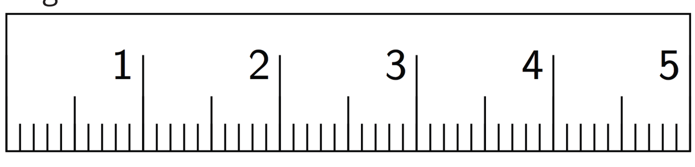
7.1 Measuring Segments

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

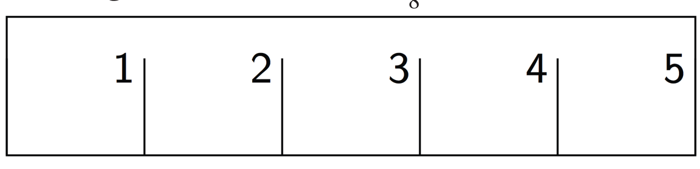
1. Find the length of this segment to the nearest $\frac{1}{8}$ of a unit.



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



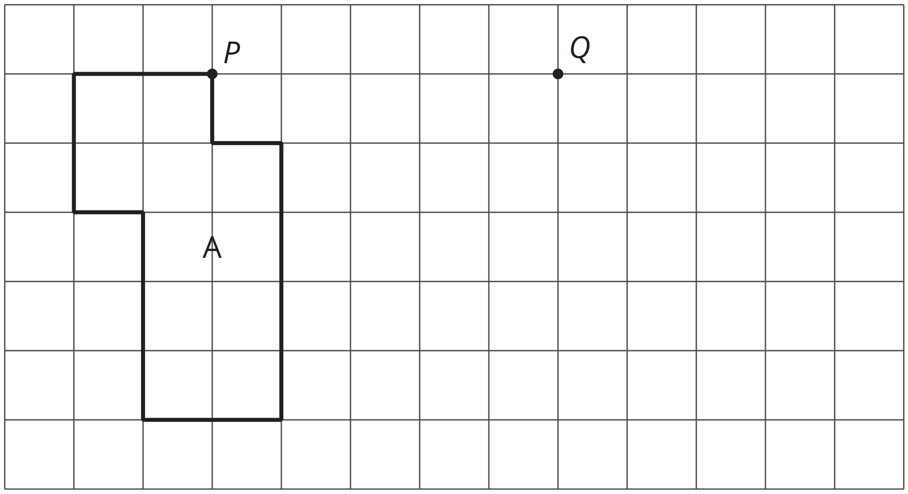
3. Estimate the length of this segment to the nearest $\frac{1}{8}$ of a unit.



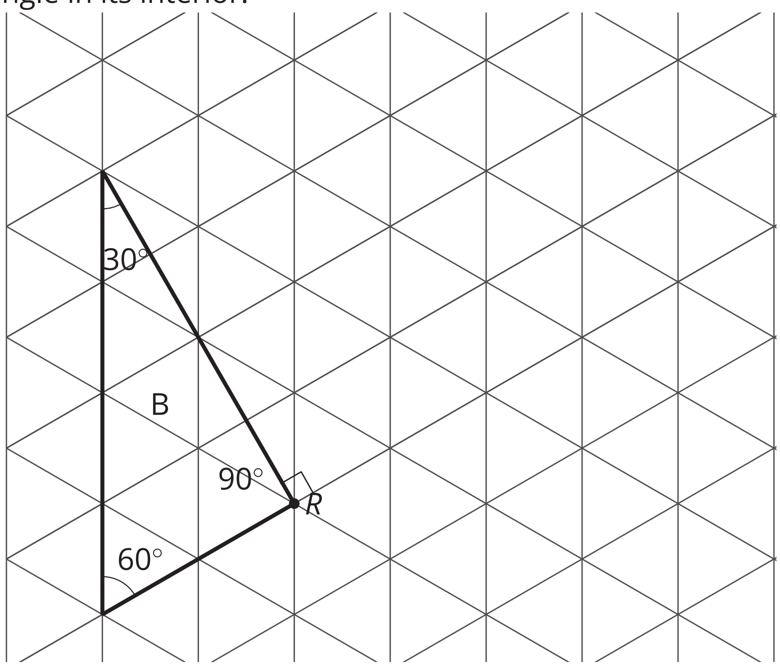
4. Estimate the length of the segment in the prior question to the nearest 0.1 of a unit.

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.



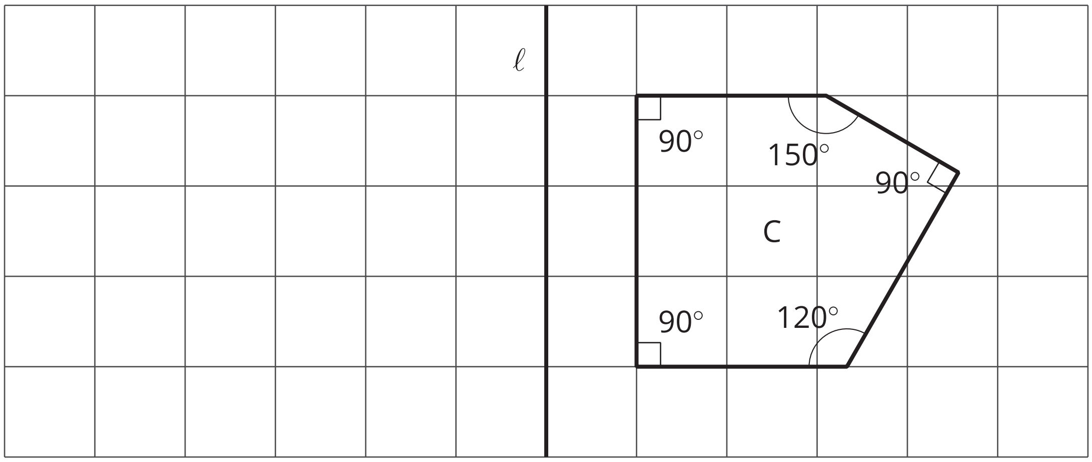
2. Rotate Triangle B 90° clockwise using R as the center of rotation. In the image, write the measure of each angle in its interior.



3. Reflect Pentagon C across line ℓ.

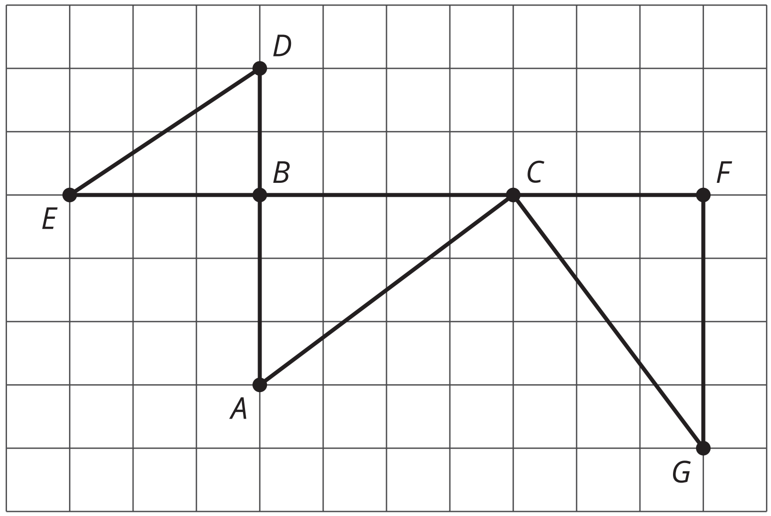
   a. In the image, write the length of each side, in grid units, next to the side. You may need to make your own ruler with tracing paper or a blank index card.

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



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 other triangle? Explain how you know.

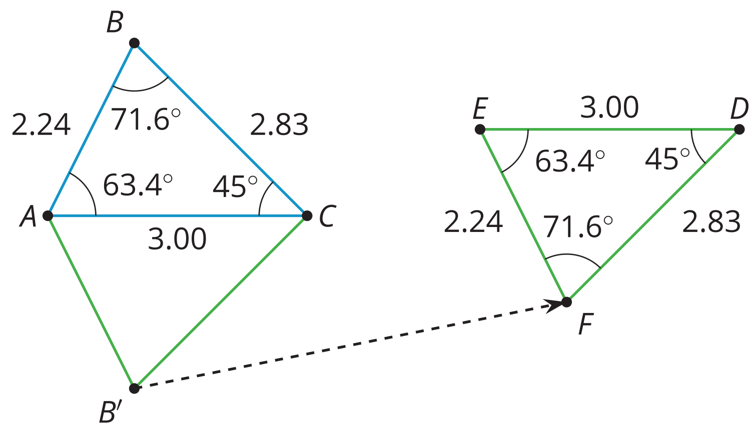
2. Describe a rigid transformation that takes ABC to the triangle you selected.

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