

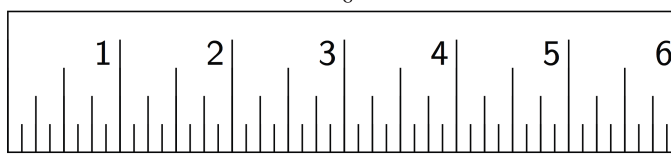
# No Bending or Stretching

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

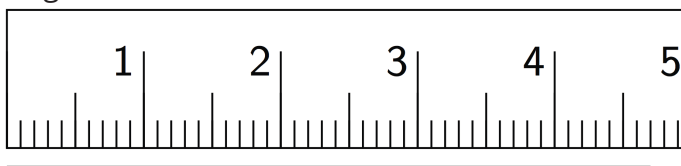
## 6.1 Measuring Segments

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

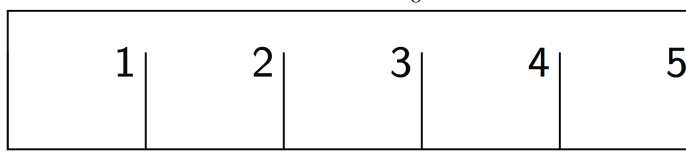
1. Find the length of this segment to the nearest  $\frac{1}{8}$  of a unit.



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



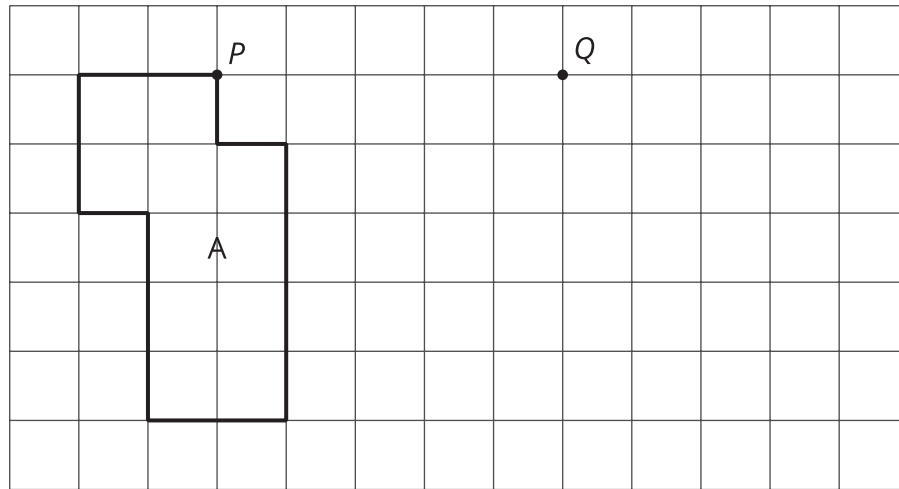
3. Estimate the length of this segment to the nearest  $\frac{1}{8}$  of a unit.



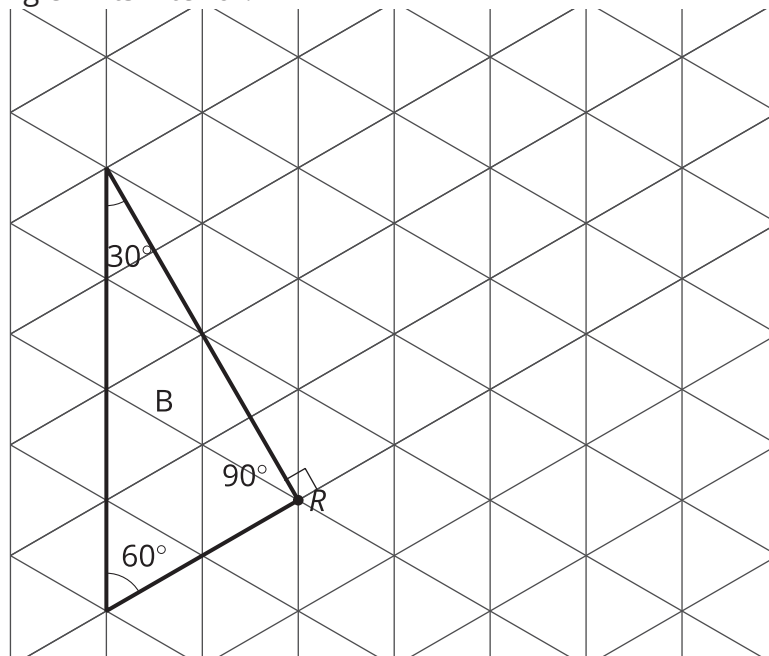
4. Estimate the length of the segment in the prior question to the nearest 0.1 of a unit.

## 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.

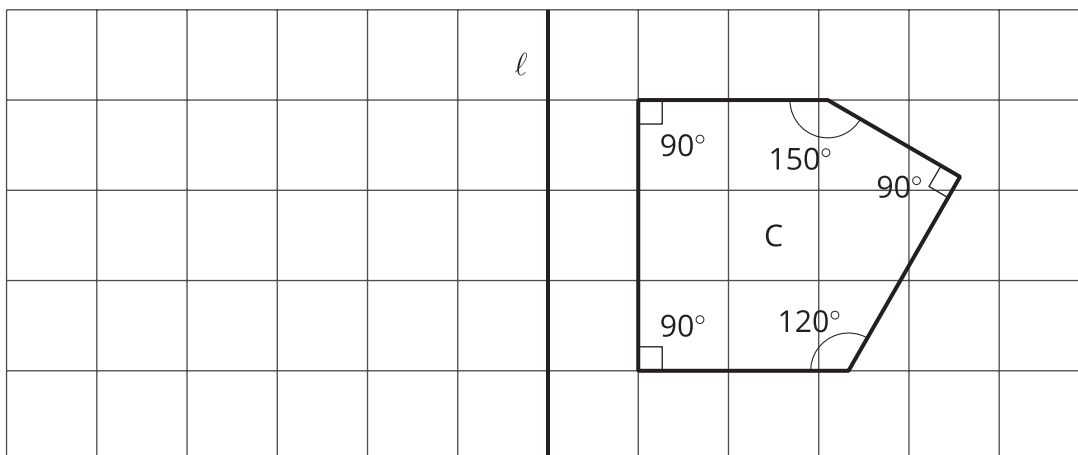


2. Rotate Triangle B  $90^\circ$  clockwise using  $R$  as the center of rotation. In the image, write the measure of each angle in its interior.



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

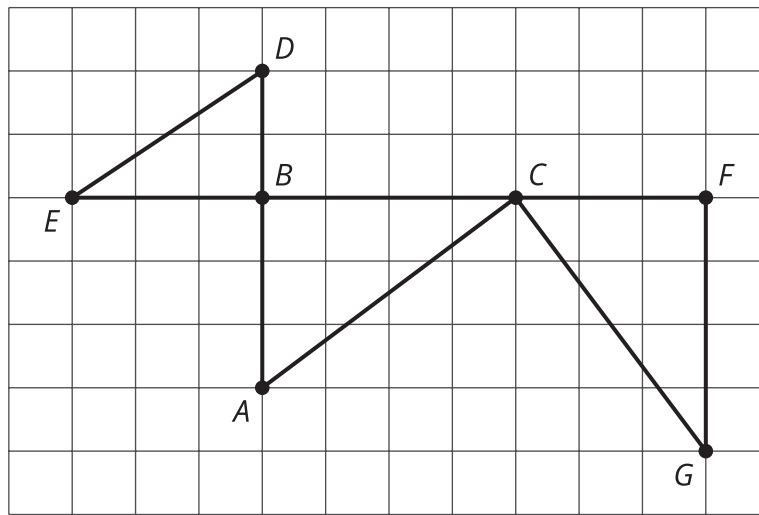
- In the image, write the length of each side, in grid units, next to the side. You may need to make your own ruler with tracing paper or a blank index card.
- In the image, write the measure of each angle in the interior.



## 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.

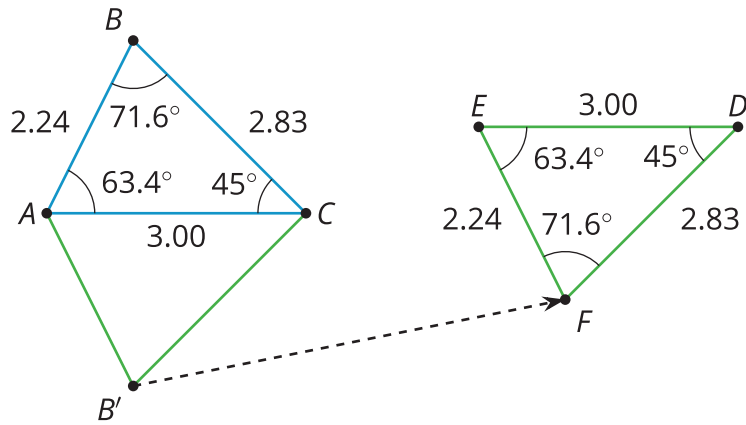
1. Which other triangle? Explain how you know.
2. Describe a rigid transformation that takes  $ABC$  to the triangle you selected.

### 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 $EFD$ |
|--------------------------------|---|
| $AB = 2.24$                    | $EF = 2.24$                               |
| $BC = 2.83$                    | $FD = 2.83$                               |
| $CA = 3.00$                    | $DE = 3.00$                               |
| 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 $DEF = 63.4^\circ$                  |