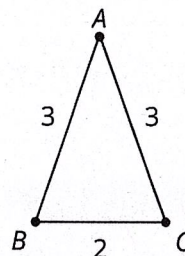


Lesson 10: Composing Figures

Let's use reasoning about rigid transformations to find measurements without measuring.

10.1: Angles of an Isosceles Triangle

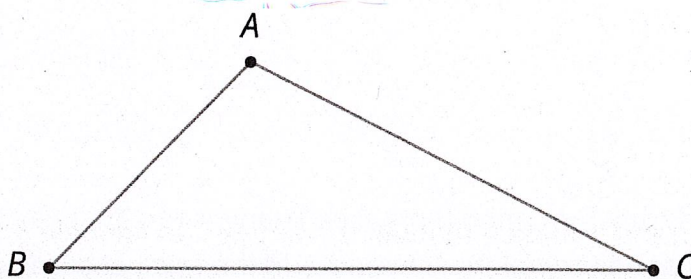
Here is a triangle.



1. Reflect triangle ABC over line AB . Label the image of C as C' .
2. Rotate triangle ABC' around A so that C' matches up with B .
3. What can you say about the measures of angles B and C ?

10.2: Triangle Plus One

Here is triangle ABC .



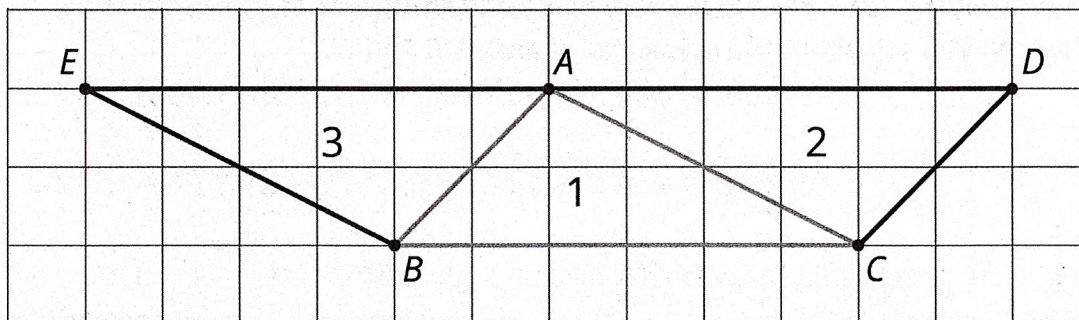
1. Draw midpoint M of side AC .
2. Rotate triangle ABC 180 degrees using center M to form triangle CDA . Draw and label this triangle.
3. What kind of quadrilateral is $ABCD$? Explain how you know.

Are you ready for more?

In the activity, we made a parallelogram by taking a triangle and its image under a 180-degree rotation around the midpoint of a side. This picture helps you justify a well-known formula for the area of a triangle. What is the formula and how does the figure help justify it?

10.3: Triangle Plus Two

The picture shows 3 triangles. Triangle 2 and Triangle 3 are images of Triangle 1 under rigid transformations.

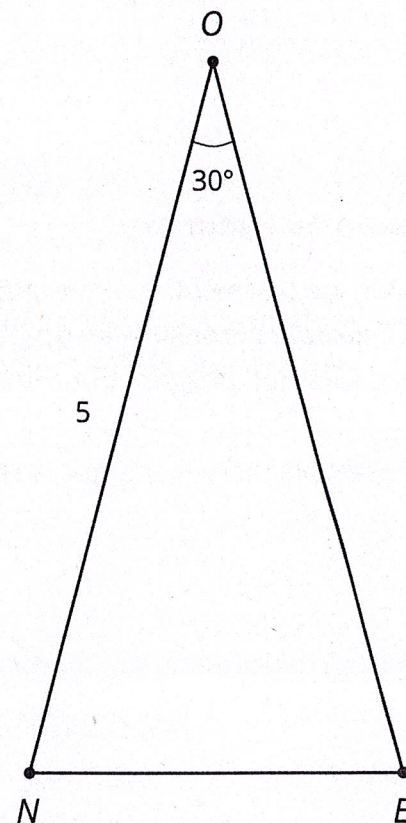


1. Describe a rigid transformation that takes Triangle 1 to Triangle 2. What points in Triangle 2 correspond to points A , B , and C in the original triangle?
2. Describe a rigid transformation that takes Triangle 1 to Triangle 3. What points in Triangle 3 correspond to points A , B , and C in the original triangle?

3. Find two pairs of line segments in the diagram that are the same length, and explain how you know they are the same length.
4. Find two pairs of angles in the diagram that have the same measure, and explain how you know they have the same measure.

10.4: Triangle ONE Plus

Here is isosceles triangle ONE . Its sides ON and OE have equal lengths. Angle O is 30 degrees. The length of ON is 5 units.



1. Reflect triangle ONE across segment ON . Label the new vertex M .
2. What is the measure of angle MON ?

