Grade 8: Rigid Rotation

8.G.A.1 - Verify experimentally the properties of rotations, reflections, and translations:

8.G.A.1b - Angles are taken to angles of the same measure.

In triangle ABC, the largest angle measures 75°. Suppose you create a new triangle by rotating triangle ABC clockwise by 40° about point B. What will be the largest angle measure in the new triangle?
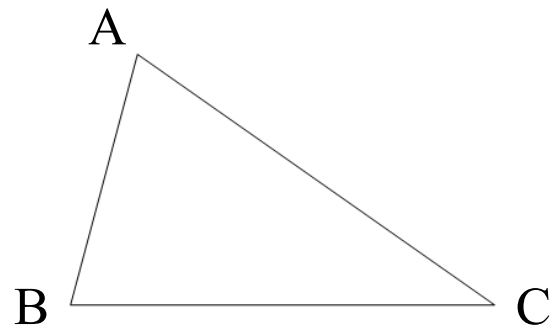
Write the correct answer.

Answer: ☐ degrees

Solution

Correct if student writes 75.

Rotating a geometric figure leaves every angle in the figure unchanged. Therefore, if the largest angle measured 75° to begin with, then the largest angle will still measure 75° after the rotation.

If students answer this question wrong, you might explain the problem by taking a piece of paper and cutting off one corner to make a triangle. Set the triangle down on a table and rotate it various ways, using your finger to hold one corner of the triangle pinned in place. Observe that as the triangle rotates, its three angles don't change in size (angle measure).

To change the angles of a triangle, one could imagine drawing the triangle on a flat piece of silly putty, and then stretching the silly putty. This stretching would likely change the angles of the triangle, and it would probably also

cause the sides of the triangle to curve. By contrast, the operations that students study in geometry (rotations, reflections, and rotations) all preserve lengths and angle measures, and they have other properties as well, including preserving the straightness of lines and line segments.

Elaboration on Alignment

This is intended to be an easy problem in the geometry of the grade level. No calculations with coordinates are required, nor are any multi-step transformations required (for example, inventing a sequence of transformations that maps a given shape to a given congruent shape). The distinction between similarity and congruence isn't assessed.

Specifying the amount of angle in the rotation (40°) creates the possibility of a student entering a value other than 75, such as 75 + 40, 75 – 40, or 40.

The triangle is drawn to scale, with angles measuring 35°, 75°, and 70°.

Learn More

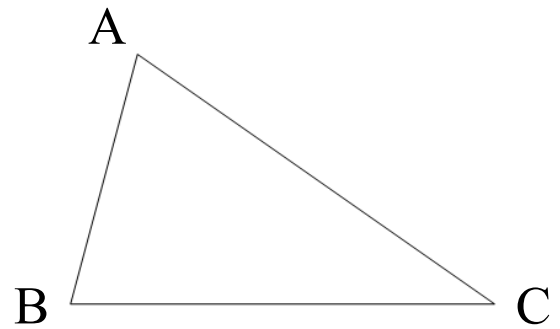See a digital version of this task at Learning Heroes' Readiness Check:
https://bealearninghero.org/readiness-check

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