

Additional Practice 16-4

Construct Arguments

Another Look!

If two angles in a triangle each measure 40° , the triangle is an obtuse triangle.

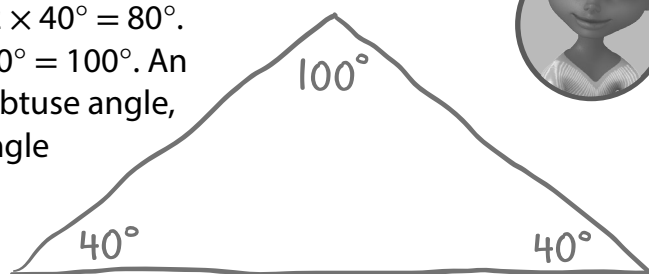
Tell how you can construct a math argument to justify the statement above.

- I can make a drawing to support my argument.
- I can make my explanation clear and complete.

Construct a math argument to justify the statement.

The sum of the measures of two angles is $2 \times 40^\circ = 80^\circ$.
The measure of the third angle is $180^\circ - 80^\circ = 100^\circ$. An angle that measures more than 90° is an obtuse angle, so the third angle is obtuse. Since the triangle contains an obtuse angle, it is an obtuse triangle.

To help you find the measure of the third angle, remember that the sum of the measures of the angles in a triangle is 180° .



Construct Arguments

Samantha says, "A triangle can have three right angles."

Sample answers are given.

1. List some properties of a triangle. How does knowing the properties of a triangle help in constructing your argument?

Properties: 3 sides, 3 angles, sum of measures of angles is 180° . Knowing the properties of a triangle provides support for my argument.

Think about whether properties, definitions, and diagrams would help you construct arguments.

2. How can you use a drawing to construct an argument?

I can use a drawing to support or disprove my argument.

3. Is Samantha correct? Construct a math argument to justify your answer.

No; The sum of the measures of the angles of a triangle is 180° . So, you cannot have a triangle that has three right angles because the angles would have a total measure of $3 \times 90^\circ = 270^\circ$.

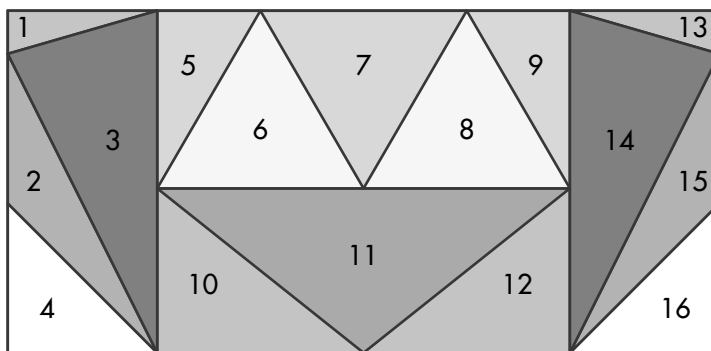




Performance Task

Stained-Glass Window

Quentin took a picture of a stained-glass window he saw at the library. He is using what he has learned about triangles to classify the triangles in the window. **Sample answers are given.**



4. **Construct Arguments** Which triangles are right triangles? Construct a math argument to justify your answer.

Triangles 1, 4, 5, 9, 10, 12, 13, 16; These are right triangles because they each have a right angle.

5. **Construct Arguments** Which triangles could be right isosceles triangles? Construct a math argument to justify your answer.

Triangles 4 and 16; These triangles each have a right angle and two sides that look to be the same length.

6. **Construct Arguments** Which triangles are obtuse isosceles triangles? Construct a math argument to justify your answer.

Triangle 11; This is an isosceles obtuse triangle because it has an obtuse angle and two sides that are the same length.

7. **Be Precise** How should Quentin classify Triangles 6, 7, and 8? Use the most precise name you can.

These are equilateral triangles because all sides are the same length.

8. **Use Structure** Choose a triangle that was not listed in Exercises 4–7. Use structure to classify it by both its angles and sides.

Sample answer: Triangle 2 is an obtuse scalene triangle.

Using definitions of geometric figures can help you to construct arguments.

