

Triangle Type Detectives

Use angles and side lengths to name every triangle.

GRADE 5 • 5.MG.3.b

5.MG.3.b "Classify triangles as right, acute, or obtuse and equilateral, scalene, or isosceles and justify reasoning."

NAME _____

DATE _____

TWO WAYS TO CLASSIFY

Classify the angles first. A triangle is right when it has one 90° angle, acute when all its angles are less than 90° , and obtuse when one angle is greater than 90° . Then classify its sides: equilateral has three equal sides, isosceles has exactly two equal sides, and scalene has no equal sides.

WORKED EXAMPLE

A triangle has one 90° angle and side lengths of 9 cm, 12 cm, and 15 cm. Classify the triangle by its angles and sides.

1. One angle is 90° , so the triangle is right.
2. The side lengths 9 cm, 12 cm, and 15 cm are all different.
3. A triangle with no equal sides is scalene.

Answer: right scalene

PRACTICE 6 problems

- 1** A triangle has angles of 38° , 71° , and 71° . It has exactly two equal sides. Classify the triangle by its angles and sides. Justify your answer.

ANSWER _____

- 2** A triangle has angles of 102° , 35° , and 43° . All three side lengths are different. Classify the triangle by its angles and sides. Justify your answer.

ANSWER _____

- 3** A triangle has one right angle and exactly two equal sides. Classify the triangle by its angles and sides. Justify your answer.

ANSWER _____

- 4** A triangle has three 60° angles and three equal sides. Classify the triangle by its angles and sides. Justify your answer.

ANSWER _____

- 5** A triangle has angles of 89° , 46° , and 45° . All three side lengths are different. Classify the triangle by its angles and sides. Justify your answer.

ANSWER _____

- 6** A triangle has angles of 120° , 30° , and 30° . It has exactly two equal sides. Classify the triangle by its angles and sides. Justify your answer.

ANSWER _____

APPLY IT Show your work

- 1** At a robotics competition, a team makes a triangular pennant. The pennant has one right angle and exactly two equal sides. How should the team classify the pennant? Explain.

WORK SPACE

ANSWER _____

- 2** A triangular stage decoration for a music festival has angles of 110° , 35° , and 35° . Its two matching sides are equal. How should the decoration be classified? Explain.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

A triangle has angles of 47° and 68° . It is said to have exactly two equal sides. Can this information describe one triangle? Find the third angle and explain your reasoning.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A triangle has angles of 38° , 71° , and 71° . It has exactly two equal sides. Classify the triangle by its angles and sides. Justify your answer.	acute isosceles; all three angles are less than 90°, and exactly two sides are equal.
2	A triangle has angles of 102° , 35° , and 43° . All three side lengths are different. Classify the triangle by its angles and sides. Justify your answer.	obtuse scalene; 102° is greater than 90°, and all three sides are different lengths.
3	A triangle has one right angle and exactly two equal sides. Classify the triangle by its angles and sides. Justify your answer.	right isosceles; it has a right angle and exactly two equal sides.
4	A triangle has three 60° angles and three equal sides. Classify the triangle by its angles and sides. Justify your answer.	acute equilateral; all three angles are less than 90°, and all three sides are equal.
5	A triangle has angles of 89° , 46° , and 45° . All three side lengths are different. Classify the triangle by its angles and sides. Justify your answer.	acute scalene; all three angles are less than 90°, and all three sides are different lengths.
6	A triangle has angles of 120° , 30° , and 30° . It has exactly two equal sides. Classify the triangle by its angles and sides. Justify your answer.	obtuse isosceles; 120° is greater than 90°, and exactly two sides are equal.

PART 2 • APPLY IT

- right isosceles; it has one right angle and exactly two equal sides.** A right angle makes the pennant a right triangle. Exactly two equal sides make it isosceles.
- obtuse isosceles; 110° is greater than 90° , and two sides are equal.** The 110° angle makes the decoration obtuse. The two equal sides make it isosceles.

CHALLENGE

No. The third angle is 65° because $180^\circ - 47^\circ - 68^\circ = 65^\circ$. All three angles are different, so all three sides would be different, not exactly two equal.

Accept the two classifications in either order when the justification is correct. For the challenge, accept equivalent wording that explains that three different angle measures mean the triangle must be scalene.