LESSON MAKER PRO

Triangle Truths

Use angles and sides to solve triangle puzzles.

GRADE 6 · TEKS 6.8.A

6.8.A "extend previous knowledge of triangles and their properties to include the sum of angles of a triangle, the relationship between the lengths of sides and measures of angles in a triangle, and determining when three lengths form a triangle;"

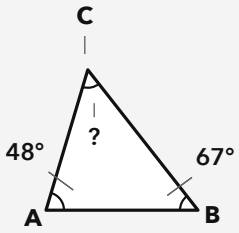
NAME _____ DATE _____

TRIANGLE RULES

The measures of the three interior angles in any triangle add to 180°. A longer side is opposite a larger angle. Three lengths form a triangle only when the sum of any two lengths is greater than the third length.

WORKED EXAMPLE

In triangle ABC, angle A = 48° and angle B = 67°. Find angle C.

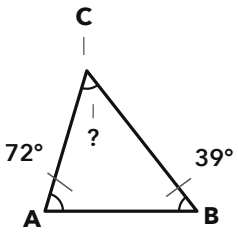


1. m∠A + m∠B + m∠C = 180°
2. 48° + 67° + m∠C = 180°
3. m∠C = 180° - 115° = 65°

Answer: 65°

PRACTICE 6 problems

1 In triangle ABC shown, angle A = 72° and angle B = 39°. Find angle C.

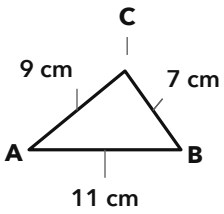


ANSWER _____

2 Can lengths 6 cm, 10 cm, and 17 cm form a triangle? Show the comparison that proves your answer.

ANSWER _____

3 In triangle ABC shown, AB = 11 cm, BC = 7 cm and CA = 9 cm. Which angle is opposite the 11 cm side?



ANSWER _____

4 Can lengths 8 cm, 12 cm, and 15 cm form a triangle? Show the comparison that proves your answer.

ANSWER _____

_____

5 Triangle PQR has side lengths PQ = 13 cm, QR = 10 cm, and PR = 6 cm. Name the smallest angle.

ANSWER _____

6 Triangle JKL has angle measures J = 101°, K = 41°, and L = 38°. Name the longest side.

ANSWER _____

APPLY IT Show your work

1 Maya is building a small triangular frame for her game-display sign. She has rods that are 14 cm, 18 cm, and 31 cm long. Can she make a triangle with all three rods?

WORK SPACE

ANSWER _____

2 A triangular team pennant has vertices A, B, and C. Angle A measures 53° and angle B measures 71°. Find the measure of angle C, then name the longest side.

WORK SPACE

ANSWER _____

CHALLENGE One step up

In triangle ABC, angle A = 2x°, angle B = (x + 20)°, and angle C = 70°. Find x. Then name the longest side and explain how you know.

WORK SPACE AND ANSWER

ANSWER KEY

Triangle Truths

GRADE 6 · TEKS 6.8.A

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	In triangle ABC shown, angle A = 72° and angle B = 39°. Find angle C.	**69°**
2	Can lengths 6 cm, 10 cm, and 17 cm form a triangle? Show the comparison that proves your answer.	**No; 6 + 10 = 16, and 16 < 17.**
3	In triangle ABC shown, AB = 11 cm, BC = 7 cm and CA = 9 cm. Which angle is opposite the 11 cm side?	**∠C**
4	Can lengths 8 cm, 12 cm, and 15 cm form a triangle? Show the comparison that proves your answer.	**Yes; 8 + 12 = 20, and 20 > 15.**
5	Triangle PQR has side lengths PQ = 13 cm, QR = 10 cm, and PR = 6 cm. Name the smallest angle.	**∠Q**
6	Triangle JKL has angle measures J = 101°, K = 41°, and L = 38°. Name the longest side.	**KL**

PART 2 · APPLY IT

1. **Yes, she can make a triangle.** Check the two shortest rods: 14 + 18 = 32. Since 32 > 31, the three rods form a triangle.
2. **Angle C = 56°; AC is the longest side.** 53 + 71 = 124, so angle C is 180 - 124 = 56°. Angle B is largest, so the opposite side, AC, is longest.

CHALLENGE

x = 30. The angles are A = 60°, B = 50°, and C = 70°, so AB is the longest side because it is opposite the largest angle, C.

Accept angle names written in words or with angle notation. For triangle-inequality explanations, accept any correct comparison showing that the two shortest lengths are greater than, or not greater than, the longest length.