LESSON MAKER PRO

Triangle Angle Detectives

Use interior and exterior angle relationships.

GRADE 8 · MA.8.GR.1.5

MA.8.GR.1.5 "Solve problems involving the relationships of interior and exterior angles of a triangle."

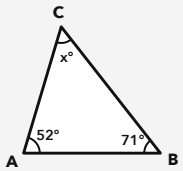
NAME _____ DATE _____

ANGLE CLUES

The three interior angles of any triangle add to 180°. An exterior angle equals the sum of its two remote interior angles, the interior angles not next to it.

WORKED EXAMPLE

Find x in the triangle shown.



1. 52 + 71 + x = 180
2. 123 + x = 180
3. x = 57

Answer: x = 57°

PRACTICE 4 problems

1 A triangle has angles 38°, 64°, and x°. Find x.

ANSWER _____

2 An exterior angle is 137°. One remote interior angle is 59°. Find the other remote interior angle.

ANSWER _____

3 An exterior angle is (4x + 6)°. Its remote interior angles are (2x + 18)° and (x + 21)°. Find x.

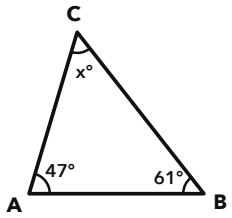
ANSWER _____

4 An interior angle is (3x + 12)°. Its adjacent exterior angle is (5x - 8)°. Find x.

ANSWER _____

APPLY IT Show your work

1 A skateboard designer uses the triangular sticker shown. Find x.



ANSWER _____

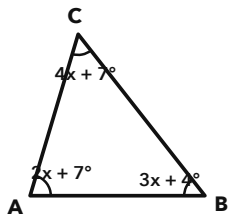
2 At a robotics contest, a triangular course marker has an exterior angle of 146°. One remote interior angle is 68°. Find the other remote interior angle.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Use the triangle shown. Find x. Then explain how you know the angle measures make a triangle.



WORK SPACE AND ANSWER

ANSWER KEY

Triangle Angle Detectives

GRADE 8 · MA.8.GR.1.5

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A triangle has angles 38°, 64°, and x°. Find x.	**x = 78°**
2	An exterior angle is 137°. One remote interior angle is 59°. Find the other remote interior angle.	**78°**
3	An exterior angle is (4x + 6)°. Its remote interior angles are (2x + 18)° and (x + 21)°. Find x.	**x = 33**
4	An interior angle is (3x + 12)°. Its adjacent exterior angle is (5x - 8)°. Find x.	**x = 22**

PART 2 · APPLY IT

1. **x = 72°** Add the three interior angles: 47 + 61 + x = 180. Solve for x.
2. **78°** The exterior angle equals the two remote interior angles. Subtract 68 from 146.

CHALLENGE

x = 18; the angles are 43°, 58°, and 79°, and 43 + 58 + 79 = 180°.

Accept equivalent equations and correct use of degree symbols. For exterior-angle items, accept solutions that add the remote interior angles or subtract one remote interior angle from the exterior angle.