LESSON MAKER PRO

# Triangle Angle Detectives

*Use a straight angle to solve triangle puzzles.*

**GRADE 7 · 7A.GM.B.38.a**

**7A.GM.B.38.a** "Use informal arguments to establish that the sum of the interior angles of a triangle is 180 degrees."

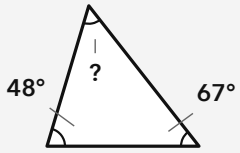
NAME _____ DATE _____

### WHY 180°?

Imagine a line through one vertex of a triangle that is parallel to the opposite side. The other two interior angles match angles on that line; with the angle at the vertex, they fill a straight angle of 180°. Subtract known angles from 180° to find a missing angle.

**WORKED EXAMPLE**

Find the angle marked ? in the triangle.

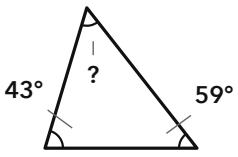



1. The three interior angles add to 180°.
2. 48° + 67° + ? = 180°
3. 115° + ? = 180°, so ? = 65°.

**Answer: 65°**

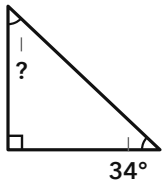
## PRACTICE 6 problems

**1** Find the angle marked ?.



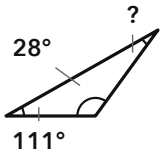

**ANSWER** _____

**2** Find the angle marked ?.



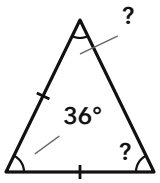

**ANSWER** _____

**3** Find the angle marked ?.




**ANSWER** _____

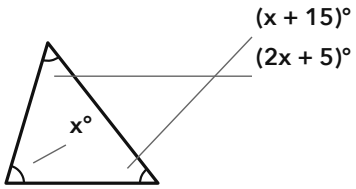
**4** Find both angles marked ?.




**ANSWER** _____

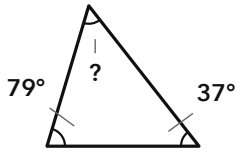
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**5** Find x.




**ANSWER** _____

**6** A classmate says the angle marked ? is 62°. Is that correct? Give the correct angle and show one calculation.

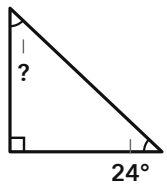



**ANSWER** _____

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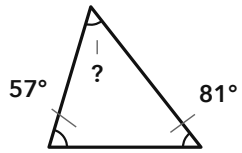
## APPLY IT Show your work

**1** The side of a skatepark ramp has the triangular shape shown. Find the angle marked ?.




**ANSWER** _____

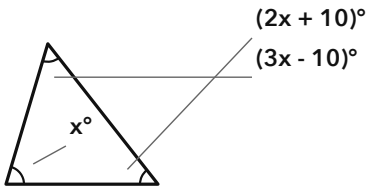
**2** A designer is making a triangular icon for a game. Find the angle marked ?.




**ANSWER** _____

## CHALLENGE One step up

Find x and all three angles. Explain why you can set the sum of the three angle expressions equal to 180°.




WORK SPACE AND ANSWER

**ANSWER KEY**

# Triangle Angle Detectives

**GRADE 7 · 7A.GM.B.38.a**

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | Find the angle marked ?. | **78°** |
| 2 | Find the angle marked ?. | **56°** |
| 3 | Find the angle marked ?. | **41°** |
| 4 | Find both angles marked ?. | **72° and 72°** |
| 5 | Find x. | **x = 40** |
| 6 | A classmate says the angle marked ? is 62°. Is that correct? Give the correct angle and show one calculation. | **No. 180° - 79° - 37° = 64°.** |

## PART 2 · APPLY IT

1. **66°** A right angle is 90°, so 180° - 90° - 24° = 66°.
2. **42°** Subtract the two known angles from 180°: 180° - 57° - 81° = 42°.

## CHALLENGE

**x + (2x + 10) + (3x - 10) = 180, so 6x = 180 and x = 30. The angles are 30°, 70°, and 80°. A line through one vertex parallel to the opposite side shows that the three interior angles fit together along a straight angle.**

Accept any correct subtraction or addition equation for a missing angle. For the challenge, accept a clear straight-angle argument, including one based on matching angles along a parallel line.