LESSON MAKER PRO

Triangle Angle Detective

Use angle relationships to find and justify missing measures.

HIGH SCHOOL · MT.CORE.GEOM.ARG.1

MT.CORE.GEOM.ARG.1 "Investigate, conjecture, prove theorems, and communicate the proofs in a variety of ways by: Proving theorems about lines and angles. Theorems include: vertical angles are congruent..."

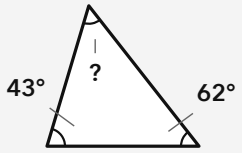
NAME _____ DATE _____

THE ANGLE-SUM RULE

The three interior angles of a triangle add to 180°. To find a missing angle, subtract the known measures from 180°. If two sides are congruent, the angles opposite those sides are congruent.

WORKED EXAMPLE

Find the missing angle in the triangle.

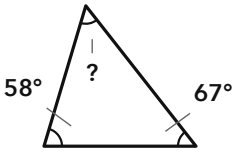


1. 43° + 62° = 105°.
2. 180° - 105° = 75°.

Answer: 75°

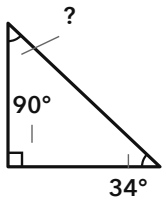
PRACTICE 6 problems

1 Find the missing angle.



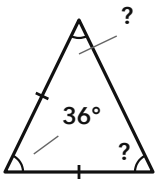
ANSWER _____

2 Find the missing angle.



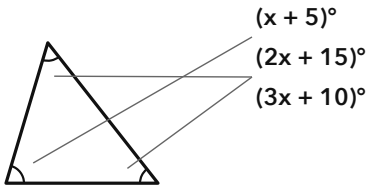
ANSWER _____

3 Find both missing angles.



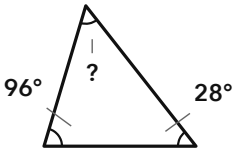
ANSWER _____

4 Find x.



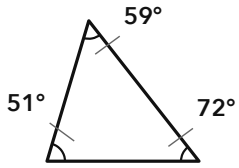
ANSWER _____

5 Find the missing angle.



ANSWER _____

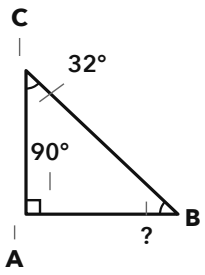
6 Could a triangle have the three angles shown? Explain using the angle-sum rule.



ANSWER _____

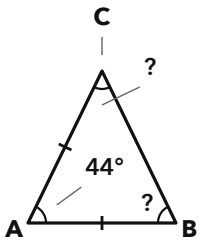
APPLY IT Show your work

1 The side of a skate ramp has the shape shown. Find angle B. Use the triangle angle sum to explain your answer.



ANSWER _____

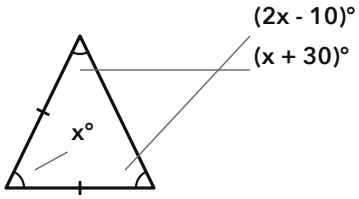
2 A club designs a triangular banner with the shape shown. Find angles B and C. Explain why they have the same measure.



ANSWER _____

CHALLENGE One step up

Find x. Then show that the angle measures fit both the marked congruent sides and the triangle angle-sum rule.



WORK SPACE AND ANSWER

ANSWER KEY

Triangle Angle Detective

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find the missing angle.	**55°**
2	Find the missing angle.	**56°**
3	Find both missing angles.	**72° and 72°**
4	Find x.	**x = 25**
5	Find the missing angle.	**56°**
6	Could a triangle have the three angles shown? Explain using the angle-sum rule.	**No. The angles add to 182°, not 180°.**

PART 2 · APPLY IT

1. **Angle B is 58°.** The angles of a triangle sum to 180°, so angle B measures 180° - 90° - 32° = 58°.
2. **Angles B and C are each 68°.** The marked sides are congruent, so angles B and C are congruent. Each measures (180° - 44°)/2 = 68°.

CHALLENGE

x = 40. The angles are 40°, 70°, and 70°. The angles opposite the marked congruent sides match, and 40° + 70° + 70° = 180°.

Accept equivalent calculations or short explanations that correctly use the triangle angle-sum rule. For the isosceles items, accept a reference to the marked congruent sides as justification for equal base angles.