LESSON MAKER PRO

Prove the Angle

Use angle facts to support or reject a claim.

HIGH SCHOOL · GDA.GM.H

GDA.GM.H "Proof is the means by which we demonstrate whether a statement is true or false mathematically, and proofs can be communicated in a variety of ways (e.g., two-column, paragraph)."

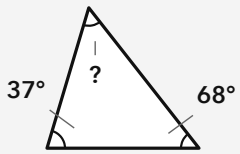
NAME _____ DATE _____

SHOW WHY

A proof gives a reason for each step, whether you write it as a paragraph or a list of statements and reasons. The angles in a triangle add to 180°. To disprove a claim, show why it fails.

WORKED EXAMPLE

Find the missing angle. Give a reason for each step.



1. 37° + 68° + x = 180° (triangle angle sum)
2. 105° + x = 180° (add)
3. x = 75° (subtract 105°)

Answer: 75°

PRACTICE 4 problems

1 Claim: A triangle can have angles of 42°, 58°, and 80°. Prove or disprove the claim with an equation.

ANSWER _____

2 Claim: A triangle can have angles of 48°, 72°, and 70°. Prove or disprove the claim with an equation.

ANSWER _____

3 Claim: An angle supplementary to a 119° angle measures 61°. Prove or disprove the claim with an equation.

ANSWER _____

_____

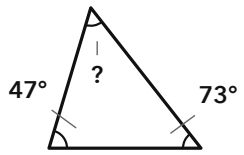
4 Claim: Every triangle has at least two acute angles. Prove or disprove using the triangle angle sum.

ANSWER _____

_____

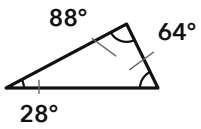
APPLY IT Show your work

1 A skate park uses a triangular brace for a ramp. Find the missing angle, then write a sentence proving your answer.



ANSWER _____

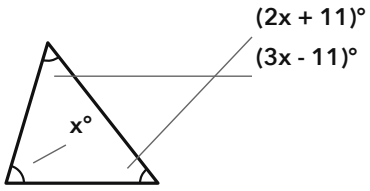
2 A game designer tests a triangular icon. A teammate says the angles shown cannot form a triangle. Disprove the claim with an equation.



ANSWER _____

CHALLENGE One step up

A classmate claims x = 31°. Disprove the claim, then find x and all three angles. Show the angle-sum equation.



WORK SPACE AND ANSWER

Prove the Angle

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Claim: A triangle can have angles of 42°, 58°, and 80°. Prove or disprove the claim with an equation.	**True. 42° + 58° + 80° = 180°, so these can be a triangle's angles.**
2	Claim: A triangle can have angles of 48°, 72°, and 70°. Prove or disprove the claim with an equation.	**False. 48° + 72° + 70° = 190°, not 180°.**
3	Claim: An angle supplementary to a 119° angle measures 61°. Prove or disprove the claim with an equation.	**True. 119° + 61° = 180°, so the angles are supplementary.**
4	Claim: Every triangle has at least two acute angles. Prove or disprove using the triangle angle sum.	**True. If two angles were each at least 90°, their sum would be at least 180°, leaving no room for the third angle.**

PART 2 · APPLY IT

1. **60°. The angles in a triangle add to 180°, and 180° - 47° - 73° = 60°.** Subtract the two known angles from 180°. Cite the triangle angle-sum theorem.
2. **The claim is false because 28° + 64° + 88° = 180°.** All three angles are positive and add to 180°, so they can form a triangle.

CHALLENGE

x + (2x + 11) + (3x - 11) = 180, so 6x = 180 and x = 30. The angles are 30°, 71°, and 79°. If x were 31, their sum would be 186°, not 180°.

Accept paragraph or statement-and-reason proofs. For the challenge, accept either the 186° calculation or the solved value x = 30 as a disproof of x = 31.