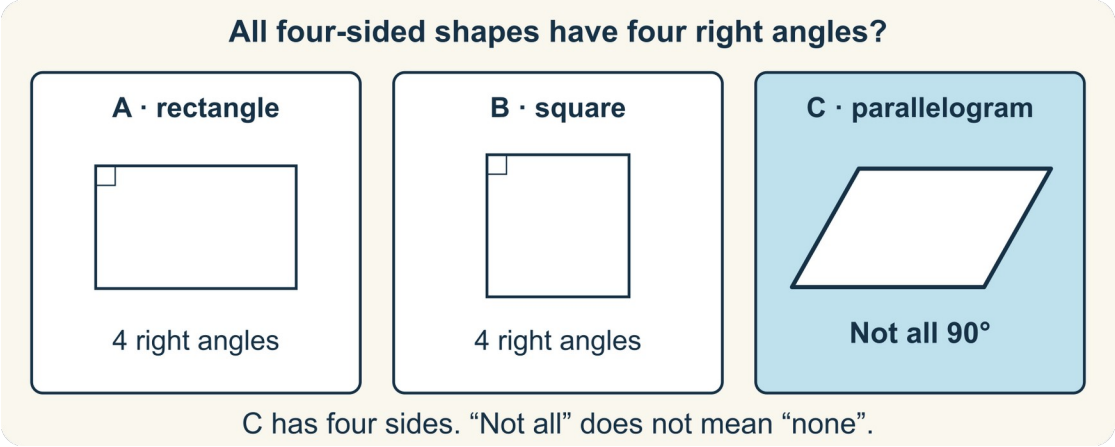
Find a shape that breaks a rule

What can one clear counterexample show about an ‘all’ claim?

Check an “all” claim with three constructed shape cards, then write exactly what one exception establishes.

Investigate | 15–25 minutes, or one comparison | Paper and a pen or pencil, The supplied model; no purchase, account or internet connection needed

Start here Draw A as a rectangle, B as a square and C as a slanted parallelogram. Keep all three closed and four-sided.



A four-sided exception

1 State the rule to test

Use this claim: “All four-sided shapes have four right angles.” A right angle is 90°. The claim concerns every quadrilateral, not just rectangles.

2 Sort support and contradiction

A and B fit the claim. C has two pairs of parallel sides but slanted corners, so not all of its angles are right angles. It still has four sides, so it is a relevant counterexample.

3 Repair the scope

A true narrower statement is: “Rectangles have four right angles.” Squares are rectangles with equal sides. The change is to the named category, not to the shape C.

4 Say what has not followed

C does not show that no quadrilateral has right angles: A and B already do. Keep “not all” separate from “none”.

One exception is enough for an all claim

These three original drawings are examples chosen to test the stated rule.

• A rectangle and B square both have four right angles. Two fitting examples cannot establish the universal claim.

• C is a parallelogram with oblique, not right, corners. It is four-sided, so it falls inside the claim but fails its stated property.

• Conclusion: not every quadrilateral has four right angles. This says nothing about how common each shape is.

What this example can show A sketch must show the intended properties clearly. A triangle would be irrelevant here because it has only three sides.

A different way

Use only A and C, or trace the four sides while someone labels the corners. Pointing to a relevant exception is enough.

If you want to go further

Test "All rectangles are squares." Construct a rectangle with unequal adjacent sides and state why the reverse category relationship does not hold.

Something to notice

Have I shown both that my example belongs to the category and that the claimed property fails?

Read or explore more

Horizon topic Categories Counterexamples

https://launchhorizonhq.com/learn/categories-counterexamples/

Horizon topic Concepts Definitions

https://launchhorizonhq.com/learn/concepts-definitions/

Horizon topic Philosophy

https://launchhorizonhq.com/learn/philosophy/

Lancaster University 3.5 Counterexamples - MATH111: Numbers and Relations

https://www.lancaster.ac.uk/~prendivs/accessible/math111/doth3.S5.html

NRICH, University of Cambridge Completing Quadrilaterals

https://nrich.maths.org/problems/completing-quadrilaterals