Deductive geometric proof

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A sample from this topic. The complete topic collection contains three different resources and worked solutions.

Read the explanation and worked example. Show your working; use a calculator only where asked.

What you will practise

• Build geometric arguments from stated facts and established theorems.

• Explain a method and check the reasonableness of a result.

Useful starting skills: Use the prerequisite operations and representations shown in the worked example.

A proof links a conclusion to reasons such as angle rules, congruence, similarity or parallel-line theorems. A measured diagram suggests a claim but does not prove every case.

Name the relevant vertices and state assumptions. Each step must follow from information already established, rather than from how the sketch looks.

Worked example

Prove the base angles of an isosceles triangle AB=AC are equal using a bisector AD.

Choose D on BC with AD bisecting angle A.

AB=AC, AD common and included angles equal give SAS congruence.

Corresponding base angles therefore match.

Answer: $\angle ABC = \angle BCA$

Try it yourself

Name: _____ Date: _____

1. A triangle has two equal sides. What theorem gives equal opposite angles?

2. Why is measuring three example triangles not a proof of an angle-sum theorem?

Answers and explanations

Check the method as well as the final answer. An alternative correct method is also valid.

1. Isosceles-triangle theorem

Equal sides face equal angles.

2. It checks only finitely many approximate cases

A proof must cover all triangles in the stated setting.

Curriculum reference: VC2M10SP01

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