I'm not a robot

If the angle bisector at A and the perpendicular bisector of BC are parallel, then ABC is isosceles. On the other hand, if they are not parallel, they intersect at a point, which we call P, and we can draw the perpendiculars from P to AB at E, and to AC at F. Now, the two triangles labeled "alpha" in this figure have equal angles and share a common side, so they are totally equal. Therefore, PE = PF. Also, since D is the midpoint of BC, it's clear that the triangles labeled "gamma" are equal right triangles, and so PB = PC. From this it follows that the triangles labeled "beta" are similar and equal to each other, so we have BE+EA = CF+FA, meaning the triangle ABC is isosceles. Let me share a mathematical gem with you, the following paradoxical theorem.Theorem.Every triangle is isosceles.Proof.Consider an arbitrary triangle $\triangle ABC$. Let $Q$ be the intersection of the angle bisector (blue) at $\angle A$ and the perpendicular bisector (green) of $BC$ at midpoint $P$.Drop perpendiculars from $Q$ to $AB$ at $R$ and to $AC$ at $S$. Because $P$ is the midpoint of $BC$ and $PQ$ is perpendicular, we deduce $BQ\cong CQ$ by the Pythagorean theorem. Since $AQ$ is the angle bisector of $\angle A$, the triangles $AQR$ and $AQS$ are similar, and since they share a hypotenuse, they are congruent. It follows that $AR\cong AS$ and also $QR\cong QS$. Therefore $\triangle BQR$ is congruent to $\triangle CQS$ by the hypotenuse-leg congruence theorem. So $RB\cong SC$. And therefore,$$AB\cong AR+RB\cong AS+SC\cong AC,$$and so the triangle is isosceles, as desired. QEDby TruthOrFake# Are Equilateral Triangles Isosceles? The claim at hand is whether equilateral triangles can be classified as isosceles triangles. This question ari...The claim at hand is whether equilateral triangles can be classified as isosceles triangles. This question arises from the definitions and properties of different types of triangles in geometry.What We KnowDefinitions: An isosceles triangle is defined as a triangle that has at least two sides of equal length and, consequently, two angles of equal measure 13. An equilateral triangle, on the other hand, is defined as a triangle with all three sides of equal length and all three angles equal to 60 degrees 28.Classification: According to various mathematical sources, all equilateral triangles are also considered isosceles triangles because they meet the criteria of having at least two sides that are equal (in fact, all three sides are equal) 3610.Mathematical Consensus: Educational resources such as Math is Fun and Cuemath confirm that equilateral triangles fall under the category of isosceles triangles 24. This classification is widely accepted in mathematical literature.AnalysisSource EvaluationWikipedia: The entry on isosceles triangles provides a basic definition and context, but as a user-edited platform, it may not always reflect the most rigorous academic standards. However, it does cite reliable references within its content 1.Math is Fun: This source is generally considered reliable for educational content, particularly for younger audiences. It presents information in a straightforward manner, making it accessible 2.Math.net: This site offers a clear explanation of isosceles triangles and includes the classification of equilateral triangles as a subset of isosceles triangles. It is a reputable source within the educational community 3.Cuemath: Known for its focus on teaching mathematics, Cuemath provides a detailed breakdown of triangle types and is considered a reliable educational resource 47.BYJU'S: This educational platform is popular for its comprehensive explanations and is often used by students for learning. It discusses the relationship between isosceles and equilateral triangles, reinforcing the classification 59.Dummies.com: This source is generally reliable for introductory information, though it may lack depth in advanced mathematical discussions. It confirms that equilateral triangles are a type of isosceles triangle 6.Conflicts of InterestNone of the sources appear to have a significant conflict of interest that would bias the information presented. They are primarily educational platforms aimed at teaching mathematical concepts.Methodology and EvidenceThe claim that equilateral triangles are isosceles is supported by definitions and classifications found in multiple educational resources. The consensus among these sources suggests that the classification is not merely a matter of opinion but is grounded in established geometric principles.However, additional context could enhance understanding. For example, exploring the historical development of triangle classifications or examining how different educational systems teach these concepts could provide a more rounded perspective.ConclusionVerdict: TrueThe classification of equilateral triangles as isosceles triangles is supported by a consensus among multiple educational resources and mathematical definitions. An isosceles triangle is defined as having at least two sides of equal length, which is a criterion that equilateral triangles meet, as they have all three sides equal. This classification is widely accepted in mathematical literature, reinforcing the validity of the claim.It is important to note that while the majority of educational sources agree on this classification, the definitions and terminologies can vary slightly in different educational contexts. Therefore, while the evidence strongly supports the classification of equilateral triangles as isosceles, readers should remain aware of potential variations in definitions across different educational systems.Additionally, the evidence presented relies on educational resources, which, while generally reliable, may not encompass all mathematical perspectives or nuances. As such, readers are encouraged to critically evaluate information and consider multiple sources when exploring geometric concepts.SourcesIsosceles triangle. Wikipedia. - Equilateral, Isosceles and Scalene. Math is Fun. triangle. Math.net. of Triangles - Definitions, Properties, Examples. Cuemath. ~:text=Types%20of%20Triangle%20Based%20on%20Sides%20and%20Angles,-The%20different%20types&text=Equilateral%20or%20Equiangular%20Triangle%3A%20When,called%20an%20isosceles%20right%20triangle.Isosceles and Equilateral Triangle. BYJU'S. Scalene, Isosceles, and Equilateral Triangles. Dummies.com. Triangle - Properties | Definition | Meaning | Examples. Cuemath. Types and Classifications: Isosceles, Equilateral, Obtuse. Math Warehouse. Special Triangles: Equilateral and Isosceles. BYJU'S. Triangle Definition, Properties, Example, Fact. Brighterly. AI-powered fact-checker analyzes claims against thousands of reliable sources and provides evidence-based verdicts in seconds. Completely free with no registration required. Try:"Coffee helps you live longer"NB: I am presenting this answer as a frame challenge. The primary motivation behind this answer is to make more permanent some of the comments left in response to the question and other answers, as well as to incorporate some ideas from a now deleted answer. The Importance of DefinitionsMathematics is a human endeavor. The words we use to describe mathematical ideas are a human invention, hence it is important to recognize that different humans might use the same word to describe different ideas, or different words to describe the same idea. When one is trying to understand a mathematical idea presented by another, it is important to understand the presenter's definitions. From the definitions, further deductions may be made.For example, in the question above, we have the definition:Definition: An isosceles triangle is a triangle with at least two congruent sides.An equilateral triangle has three congruent sides, and three is "at least" two. Therefore, per this definition, every equilateral triangle must be isosceles.However, there are authors who give a different definition of isosceles triangles. Joel Reyes Noche notes that many primary school instructors define an isosceles triangle to be one with exactly two congruent sides. Indeed, this is the definition given by Euclid himself!:Further, of trilateral figures, an equilateral triangle is that which has its three sides equal, an isosceles triangle that which has two of its sides alone equal, and a scalene triangle that which has its three sides unequal. [Euclid's Elements, as translated by Thomas Heath]Per this definition, no isosceles triangle is equilateral, and no equilateral triangle is isosceles. If a triangle is equilateral, then it is isosceles.Let's define: P: A triangle is equilateral Q: A triangle is isoscelesThe original statement in symbolic form: P QThis statement is true because all equilateral triangles are also isosceles.ConverseThe converse reverses the hypothesis and conclusion.Converse: If a triangle is isosceles, then it is equilateral.In symbolic form: Q PThis statement is false. While all equilateral triangles are isosceles, not all isosceles triangles are equilateral. An isosceles triangle can have two equal sides and one different side.InverseThe inverse negates both the hypothesis and conclusion.Inverse: If a triangle is not equilateral, then it is not isosceles.In symbolic form: P QThis statement is false. A triangle can be isosceles without being equilateral. For example, a triangle with two sides of length 5 and one side of length 4 is isosceles but not equilateral.ContrapositiveThe contrapositive negates and reverses the hypothesis and conclusion.Contrapositive: If a triangle is not isosceles, then it is not equilateral.In symbolic form: Q PThis statement is true. If a triangle is not isosceles (meaning it has no equal sides), it cannot be equilateral (which requires all sides to be equal).An isosceles triangle has at least two congruent sides.An equilateral triangle has three congruent sides.So, an equilateral triangle is a special case of isoscelestriangles.Since the equilateral triangle has three congruent sides, itsatisfies the conditions of isosceles triangle.So, equilateral triangles are always isosceles triangles.Source: www.icoachmath.comDoubtnut is No.1 Study App and Learning App with Instant Video Solutions for NCERT Class 6, Class 7, Class 8, Class 9, Class 10, Class 11 and Class 12, IIT JEE prep, NEET preparation and CBSE, UP Board, Bihar Board, Rajasthan Board, MP Board, Telangana Board etc NCERT solutions for CBSE and other state boards is a key requirement for students. Doubtnut helps with homework, doubts and solutions to all the questions. It has helped students get under AIR 100 in NEET & IIT JEE. Get PDF and video solutions of IIT-JEE Mains & Advanced previous year papers, NEET previous year papers, NCERT books for classes 6 to 12, CBSE, Pathfinder Publications, RD Sharma, RS Aggarwal, Manohar Ray, Cengage books for boards and competitive exams.Doubtnut is the perfect NEET and IIT JEE preparation App. Get solutions for NEET and IIT JEE previous years papers, along with chapter wise NEET MCQ solutions. Get all the study material in Hindi medium and English medium for IIT JEE and NEET preparationNB: I am presenting this answer as a frame challenge. The primary motivation behind this answer is to make more permanent some of the comments left in response to the question and other answers, as well as to incorporate some ideas from a now deleted answer. The Importance of DefinitionsMathematics is a human endeavor. 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**All triangles are equilateral proof. All equilateral triangles are also isosceles triangles. true false. All equilateral triangles are isosceles. All triangles are equilateral. All equilateral triangles are also isosceles.**