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Consecutive exterior angles proofs

The Theorem of Consecutive Inner Angles states that the two inner angles formed by a transverse line that crosses two parallel lines are complementary (i.c. they add up to 180°). The problemAB|| CD, show me ∠5 + m∠4 = 180°, and let me ∠3 + m∠6 = 180°Then how are we going about it? We already know that the two angles that are next to each other and that form a straight line are complementary angles and their sum is 180°. So we will try to use it here, too, as here we also have to prove that the sum of two angles is 180°. So let's proceed to the test, using what we already know about the angles that are next to each other and that form a straight line. (1) AB|| CD //given(2) ∠1 ≅ ∠5 //from parallel line axiom – corresponding angles(3) m∠1 = m∠5 //definition of congruent angles (4) m∠1 + m∠4 = 180° //definition of congruent angles (4) m∠1 + m∠4 = 180 ° //definition of congruent angles (4) m∠1 + m∠4 = 180° ///straight line measures 180° (5) m∠5 + m∠4 = 180° //usant (3) and (4), and performing algebraic replacement, replacing m∠1 with the equivalent m∠5 When two lines are cut by a transverse, the pair of angles on one side of the transverse and within the two lines are called consecutive inner angles. In the figure, angles 3 and 5 are consecutive inner angles. Also angles 4 and 6 are consecutive inner angles. If two parallel lines are cut by a transverse, then the consecutive pairs of internal angles formed are complementary. Test: Given: k ∥ l , t is a cross-disciplinary test: ∠ 3 and ∠ 5 are complementary and ∠ 4 and ∠ 6 are complementary. Statement Reason 1k ∥ l , t is a crossing. Given 2 ∠ 1 and ∠ 3 form a linear pair and ∠ 2 and ∠ 4 form a linear pair. Linear torque definition 3 ∠ 1 and ∠ 3 are supplementary m ∠ 1 + m ∠ 3 = 180° ∠ 2 and ∠ 4 are additional m ∠ 2 + m ∠ 2 4 = 180°4 ∠ 1 ≅ ∠ 5 and ∠ 2 ≅ ∠ 6 Corresponding Angles Theorem 5 ∠ 3 and ∠ 5 are supplementary ∠ 4 and ∠ 6 are supplementary. Home Property Replacement > Alternative Outer Angles - Explanation and Examples in Geometry, there is a special type of angles known as alternate angles. Alternative angles are non-adjacent angles and pairs found on opposite sides of the transverse. In this article, we will discuss alternative outer angles and their theorem. Before entering this topic, it is important to remember the following terms: angles, cross lines and parallels. That's why you have to go through the previous Articles of Angles. What are alternative outer angles? The alternate outer angles are the pair of angles found on the outer side of the two parallel lines but on both sides of the transverse line. Illustration: In the diagram above, ∠ to and ∠ d makes a couple of alternate outer angles and ∠ b and ∠c makes another pair of alternate outer angles. Notice how alternating outer angles pairs are on opposite sides of the but outside the two parallel lines. Alternative outer angle theorem The alternative outer angle states that, the resulting alternative outer angles are congruent when two parallel parallel lines are cut Transverse. With reference to the diagram above: Test the alternate outer angles theorem Consider the diagram above. The two lines are parallel. For vertical angle theorem, ∠ b = 180 – d By transitory ownership of congruence, ∠ b = ∠ c Similarly, it can be shown that, ∠ a = ∠ d We can also demonstrate the conversation of this theorem, according to which if two lines are cut by a cross, then the alternative outer angles are congruent. We solve some problems at alternative external angles. Example 1 Since L1 and L2 are parallel, look for the x value in the chart below. Solution angle (2x + 26) ° and (3x – 33) ° are alternative inner angles. Since L1 and L2 are parallel, the two angles are congruent. Therefore, we have; ⇒ (2x + 26) ° = (3x – 33) ° ⇒ 2x + 26 = 3x – 33 59 = x Therefore, x = 59 degrees. Example 2 Two alternating outer angles are given as (2x + 10) ° and (x + 5) °. Check if the angles are congruent. Solution Alternating the outer angles are the same when the cross crosses two parallel lines. Therefore, equate the two angles. ⇒ (3x + 10) ° = (x + 50) ° ⇒2 x = 40 Split both sides by 2. x = 20 Now replace x in each expression. ⇒ (2x + 10) ° ° = 50° (x + 5) = 25° Therefore, (3x + 10) ° ≠ (x + 50) ° Both angles are not congruent. This implies that the two lines crossed by the transverse are not parallel. Example 3 Prove that alternative outer angles (2x + 26) ° and (3x – 33) °are congruent. Solutions Alternative inner angles are equal, so, we have ⇒ (2x + 26) ° = (3x – 33) ° ⇒ 2x + 26 = 3x – 33 x = 59 Substitute x in the original expressions. ⇒ (2x + 26) ° = 144°. ⇒ (3x – 33) ° = = 144° Hence demonstrated, (2x + 26) ° = (3x – 33) °. Example 4 Use alternate outer-angle theorem to prove that lines 1 and 2 are parallel lines. Solution line 1 and 2 are parallel if the alternative outer angles (4x – 19) and (3x + 16) are congruent. Therefore; ⇒ 4x – 19 = 3x + 16 ⇒ 4x – 3x = 19+16 x = 35 Therefore, x = 350 Substitute x in expressions. (4x – 19)0 ⇒ 4(35) – 19 = 1210(3x + 16) = 1210 Therefore, lines 1 and 2 are parallel. Example 5: Calculate the x value and measurement of the angles listed below. Solution: The two lines L1 and L2 are parallel and, therefore, the given angles are alternate outer angles. Therefore, we can set the two equal expressions to each other to solve the problem. (3y + 53)0 = (7y −55) 0 Collect similar terms and then simplify to get, 4y = 1080 y = 270 Because alternative outer angles are congruent, then the measurement of each angle is 134 degrees. Example 6: Check if the alternate outer angles (4x – 19)0 and (3x + 16)0 are congruent. Solution: Equate the two expressions ⇒ 4x – 19 = 3x + 16 ⇒ 4x – 3x = 19+16 x = 35 Substitute x = 35 in expressions Like this, (4x – 19)0 ⇒ 4(35) – 19 = 1210 Similarly, 3x + 16 = = Since then, LHS = RHS, therefore (4x – 19)0 and (3x + 16)0 are congruent. Interesting data on alternative outer angles Alternative outer angles are congruent if the lines crossed by the are parallel. If alternative outer angles are congruent, then the lines are parallel. At each intersection, the corresponding angles are in the same place. The alternate outer angles outside the lines are intercepted by the transversality. These angles are complementary to adjacent angles. The applications of alternate outer angles Alternate outer angles are very important in our daily lives. For example: In engineering and architecture, alternative outer angles are used to design buildings, bridges, roads, etc. Another use of alternative outer angles is in appropriate elements such as sofas, chairs, tables, etc. in your home. In trigonometry, alternate outer angles can be used to calculate the height of tall structures such as buildings. Alternative outer angles are used to design regular polygons such as hexagons and many more shapes. Other settings where alternate outer angles apply include; set of squares, scissors, partially open doors, arrow point, pyramids, different alphabetical letters, cycle parses, etc. We even do different angles in different positions while doing yoga and exercises. State practice questions we theorem of alternative outer angle. If the lines are parallel, then the alternative outer angles are? Check if the alternate outer angles (2x + 6)0 and (5x – 18)0 are congruent. Demonstrate that alternative outer angles (2x + 36) ° and (3x – 43) ° are congruent. Alternative outer angles are 3x + 16° and 5x −54°. Find the value of x. Previous Lesson | Homepage | Next lesson The Theorem of Alternative Outer Angles states that, when two parallel lines are cut by a cross, the resulting alternative outer angles are congruent. So, in the following figure, if k ∥ l , then ∠ 1 ≅ ∠ 7 and ∠ 4 ≅ ∠ 6 . Test. From k ∥ l , by the Corresponding Angles Postulate, ∠ 1 ≅ ∠ 5 . In addition, for the vertical theorem angles, ∠ 5 ≅ ∠ 7 . Then, for the Transitive Property of Congruence, ∠ 1 ≅ ∠ 7 . You can prove that ∠ 4 and ∠ 6 are congruent using the same method. The conversation of this theorem is also true; that is, if two k and l lines are cut by a crossover so that the alternative outer angles are congruent, then k ∥ l . If the parallel lines are cut by a cross line, then consecutive outer angles are complementary. As seen from the image above, the two consecutive outer angles are complementary because the transverse line cuts the parallel lines. They are consecutive outer angles that add up to 180 degrees. Degrees.