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| **Name** | **Formal Definition** | **Layman’s Terms** |
| Definition of a Linear Pair | Formal Definition: Two angles that share a vertex and common side. Their non-common sides form a straight line. | Used when you want to point out in your diagram that there are these types of angles. Stated before the postulate. NOT used to show two angles are supplementary (even though they are). That is because the fact they are supplementary are not mentioned in the definition. |
| Linear Pair Postulate | Formal Definition: Two angles which form a linear pair are supplementary. | After you already acknowledged that these types of angles are in your diagram, you can use this to show these angles are supplementary. |
| Definition of Vertical Angles | Formal Definition: The angle pair that shares a vertex but not a side, formed when two lines intersect. | Used when you want to point out in your diagram that there are these types of angles. Stated before the theorem. NOT used to show two angles are congruent (even though they are). That is because the fact they are congruent is not mentioned in the definition. |
| Vertical Angles Theorem | Formal Definition: Vertical Angles are congruent. | After you already acknowledged that these types of angles are in your diagram, you can use this to show these angles are congruent. |
| Reflexive Property | Formal Definition: a = a | Shows something equals itself. Used as a pre-step to substitution. |
| Symmetric Property | Formal Definition: If a = b, then b = a. | Used in proofs so that you can switch which side of the equation in expression or term is on. |
| Transitive Property | Formal Definition: If a = b and b = c, then a = c. | Sort of like substitution (if you look at the formal definition, it looks very similar). Very helpful in proofs when you have already shown that two things you want to show are equal are equal to the same thing. Ex. If line a and b are parallel, and line b and c are parallel, then a and c must be parallel. |
| Addition Property of Equality | Formal Definition: If a = b, then a + c = b + c. | You can add the same thing to both sides of an equation. |
| Subtraction Property of Equality | Formal Definition: If a = b, then a – c = b – c. | You can subtract the same thing on both sides of an equation. |
| Division Property of Equality | Formal Definition: If a = b, then a/c = b/c. | You can divide the same thing on both sides of an equation. |
| Multiplication Property of Equality | Formal Definition: If a = b, then a(c) = b(c). | You can multiply the same thing on both sides of an equation. |
| Corresponding Angles Thm | Formal Definition: If two lines are parallel, then corresponding angles are congruent. | You can ONLY say two corresponding angles are congruent IF you have already stated the lines in which each of the angles lie are parallel and make sure they are both on the same transversal. |
| Alternate Interior Angles Theorem | Formal Definition: If two lines are parallel, then alternate interior angles are congruent. | You can ONLY say two alternate interior angles are congruent IF you have already stated the lines in which each of the angles lie are parallel and make sure they are both on the same transversal. |
| Alternate Exterior Angles Thm | Formal Definition: If two lines are parallel, then alternate exterior angles are congruent. | You can ONLY say two alternate exterior angles are congruent IF you have already stated the lines in which each of the angles lie are parallel and make sure they are both on the same transversal. |
| Consecutive Interior Angles Theorem | Formal Definition: If two lines are parallel, then corresponding angles are supplementary. | You can ONLY say two consecutive interior angles are supplementary IF you have already stated the lines in which each of the angles lie are parallel and make sure they are both on the same transversal. |
| Corresponding Angles Converse | Formal Definition: If corresponding angles are congruent, then the lines in which each angle lies are parallel. | This is used to PROVE lines are parallel. You can show two lines are parallel by using other theorems to show corresponding angles are equal. |
| Alternate Interior Angles Converse | Formal Definition: If alternate interior angles are congruent, then the lines in which each angle lies are parallel. | This is used to PROVE lines are parallel. You can show two lines are parallel by using other theorems to show alternate interior angles are equal. |
| Alternate Exterior Angles Converse | Formal Definition: If alternate exterior angles are congruent, then the lines in which each angle lies are parallel. | This is used to PROVE lines are parallel. You can show two lines are parallel by using other theorems to show alternate exterior angles are equal. |
| Consecutive Interior Angles Converse | Formal Definition: If consecutive interior angles are supplementary, then the lines in which each angles lies are parallel. | This is used to PROVE lines are parallel. You can show two lines are parallel by using other theorems to show consecutive interior angles are congruent. |
| Given | Formal Definition: Anything you are allowed to assume with other reasons. | Usually the first reason in every proof. Be sure to mark this off on your diagram. |
| Prove | Formal Definition: What you are trying to prove. | The last statement in a proof. Do not assume this and do not mark this off on your diagram. |

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| QED | Formal Definition: “quod erat demonstrandum” in latin. Translates in English to “What was to be demonstrated.” | Not a reason or a statement. Putting QED at the end of a proof is sort of like how credits are at the end of a movie, but not considered part of the movie (just like QED is not part of the proof). Just a cool way to end a proof and shout out our boy Euclid at the same time. |
| Definition of Supplementary Angles | Formal Definition: Two angles that add up to 180 degrees. | If you are using this as a reason you are most likely wrong and mean to use the linear pair postulate. |
| Polygon Sum Conjecture | Formal Definition:  S = (n-2)180 if S is the sum of the interior angles and n is the number of sides. | Use this if you know all but one angle in a polygon to find the missing angles by subtracting the known angles from the sum of the interior angles. |
| Angle Addition Postulate | Formal Definition: If angle ABC has a segment BD in between BC and BA, then the measures of angles ABD + DBC = the measure of angle ABC. | Used whenever you want to show certain angles add up to a larger angle. |
| Substitution | If a = b and b = c, then a = c. | If you know two things are equal, you can substitute one for the other. |
| Definition of a Midpoint | If B is a midpoint of AC, then AB = BC. | If it is given that a point is a midpoint, you can show then two segments including the midpoint and endpoint as endpoints are congruent, usually as a pre-step to substitution. Or if you are trying to prove B is a midpoint of AC, show that AB = BC. |
| Def of an Angle Bisector | If BD is a bisector of angle ABC, then the measure of ABD = the measure of DBC. | If it is given that a segment is a bisector of an angle, then you can show the two angles formed by the bisector are equal, usually as a pre-step to substitution. If you are trying to prove BD is a bisector of ABC, show that ABD = DBC. |