Theorem 17: Equal corresponding angles mean that lines are parallel.
Corollary 1: Equal alternate interior angles mean that lines are parallel.
Corollary 2: Supplementary interior angles on the same side of a transversal mean that lines are parallel.
Corollary 3: In a plane, two lines perpendicular to a third line are parallel.

The Parallel Postulate – Through a point not on a line, there is exactly one line parallel to the given line.
Theorem 18: In a plane, two lines parallel to a third line are parallel to each other.

Theorem 19: Parallel lines form equal corresponding angles.
Corollary 1: Parallel lines form equal alternate interior angles.
Corollary 2: Parallel lines form supplementary interior angles on the same side of a transversal.
Corollary 3: In a plane, a line perpendicular to one of two parallel lines is also perpendicular to the other.

Theorem 20: The Triangle Sum Theorem – The sum of the angles of a triangle is 180°.
Corollary 1: If two angles of one triangle are equal to two angles of another triangle, the third angles are equal.
Corollary 2: The acute angles of a right triangle are complementary.
Corollary 3: Each angle of an equilateral triangle is 60°.

Theorem 21: An exterior angle of a triangle is equal to the sum of the remote interior angles.

Theorem 22: The AAS Theorem – If two angles and the side opposite one of them in one triangle are equal to the corresponding parts of another triangle, the triangles are congruent.

Theorem 23: The HL Theorem – If the hypotenuse and a leg of one right triangle are equal to the corresponding parts of another right triangle, the triangles are congruent.

ASA, SAS, SSS

~~SSA=ASS~~

Def: A diagonal of a polygon is a line segment that connects any two nonconsecutive vertices.

Theorem 24: The sum of the angles of a quadrilateral is 360°.

Def: A rectangle is a quadrilateral each of whose angles is a right angle.

Corollary to Theorem 24: A quadrilateral is equiangular iff it is a rectangle.

In general, if a polygon has n sides, in terms of n,

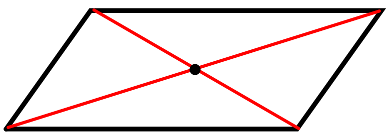
- n-3 diagonals can be drawn from one vertex
- these diagonals form n-2 triangles
- the sum of the angles of an n-gon is (n-2)*180°
- If the n-gon is equiangular, each angle measures (n-2)*180°/n

Def: A parallelogram is a quadrilateral whose opposite sides are parallel.

A figure has point symmetry if it looks exactly the same when it is rotated about a point.

Def: Two points are symmetric with respect to a point iff it is the midpoint of the line segment joining them.

Parallelograms have point symmetry about the point in which their diagonals intersect.

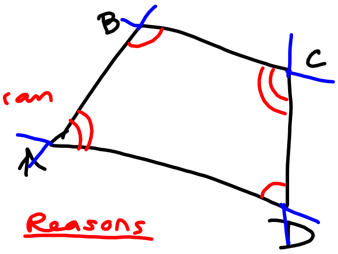


Theorem 25: The opposite sides and angles of a parallelogram are equal.
Theorem 26: The diagonals of a parallelogram bisect each other.
Theorem 27: A quadrilateral is a parallelogram if its opposite sides are equal.
Theorem 28: A quadrilateral is a parallelogram if its opposite angles are equal.

Theorem 28: A quadrilateral is a parallelogram if its opposite angles are equal.

Given: $\angle A = \angle C$
$\angle B = \angle D$

Prove: ABCD is a parallelogram

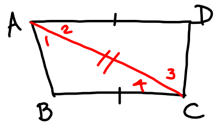


Proof

Statements	Reasons
1. $\angle A = \angle C$, $\angle B = \angle D$	Given
2. $\angle A + \angle B + \angle C + \angle D = 360°$	Quadrilateral Sum Theorem
3. $\angle A + \angle B + \angle A + \angle B = 360°$ $2\angle A + 2\angle B = 360°$	Subsitution (& simplification)
4. $\angle A + \angle B = 180°$	Division
5. $\angle A$ & $\angle B$ are supplementary	Supplementary $\angle$'s sum to 180°
5.5 $\angle C$ & $\angle B$ are supplementary	Substitution (#1 & #5)
6. BC ∥ AD BA ∥ CD	Supplementary $\angle$'s on the same side of a transversal means lines are parallel
7. ABCD is a parallelogram	Parallelogram is a quadrilateral whose opposite sides are parallel

Theorem 29: A quadrilateral is a parallelogram if two opposite sides are both parallel and equal.

Given: Quadrilateral ABCD
AD ∥ BC
AD = BC



Prove: ABCD is a parallelogram

Proof:

Statements	Reasons
1. ABCD is a quadrilateral, AD ∥ BC, AD = BC	Given
2. $\angle B$ and $\angle A$ are supplementary $\angle C$ and $\angle D$ are supplementary	Parallel lines yield supplementary interior angles on same side of transversal
3. $\angle A + \angle B + \angle C + \angle D = 360°$	Quadrilateral sum theorem
4. Draw diagonal AC	2 points define a line
5. $\angle 2 = \angle 4$	parallel lines yield equal opposite interior $\angle$'s
6. $\angle A + \angle B = 180°$ $\angle C + \angle D = 180°$	Supplementary $\angle$'s sum to 180°
7. AC = AC	reflexive
8. $\triangle CAD \cong \triangle ACB$	SAS congruence
9. AB = CD	Corresponding parts of congruent $\triangle$'s are equal
10. ABCD is a parallelogram	Quadrilaterals w/ opposite sides equal are parallelograms

HW #1 (submitted Friday, 11/7)
- Ch 1 Review Problems pp. 36-38
- Start working on Geometry badge on Khan Academy

HW #2 (submitted Friday, 11/14)
- Ch 2 Review Problems pp. 71-74
- Ch 3 Review Problems pp. 124-128
- Khan Academy exercises: "Introduction to Euclidean geometry," "Angles and intersecting lines"

HW #3 (submitted Friday, 11/21)
- Ch 4 Review Problems pp.176-180
- Khan Academy exercises: "Congruence"

HW #4 (submitted Friday, 12/5)
- Ch 5 Review Problems pp. 206-209
- Work toward mastery of practiced Khan Academy exercises in "Introduction to Euclidean Geometry," "Angles and Intersecting Lines," and "Congruence"

HW #5 (submitted Monday, 12/15)
- Ch 6 Review Problems pp. 250-254

HW #6 (due ~~Friday, 12/19~~) January
- Ch 7 Review Problems pp. 292-295

QUIZ #3 - NOW **TEST #2 - 2nd per - WED 12/18; 3rd per - THURS 12/19**