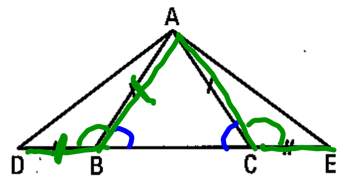
CONGRUENCE JUSTIFICATIONS

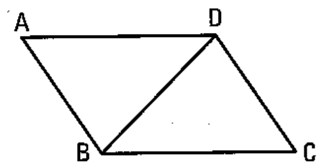
Triangle ABC is isosceles with main vertex A. If segments BD and CE are congruent, justify the statements proving that triangles ABD and ACE are congruent.



Hypothesis: – ΔABC isosceles.
– $\overline{BD} \cong \overline{CE}$.

Statement	Justification
1. $\angle ABC \cong \angle ACB$	ΔABC is isocelese ∴ ∠B & ∠C congruent
2. $\angle ABD \cong \angle ACE$	Supplementary to ∠B & ∠C
3. $\overline{AB} \cong \overline{AC}$	ΔABC is isocelese
4. $\overline{BD} \cong \overline{CE}$	Given
5. $\Delta ABD \cong \Delta ACE$	SAS

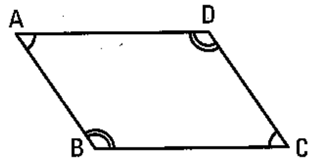
Justify the steps proving the following property:
The opposite sides of a parallelogram are congruent.



Hypothesis: – ABCD is a parallelogram.
Consider triangles ABD and CDB.

Statement	Justification
1. $\angle ADB \cong \angle DBC$	
2. $\angle ABD \cong \angle BDC$	
3. $\overline{BD} \cong \overline{BD}$	
4. $\Delta ABD \cong \Delta CDB$	
5. $\overline{AB} \cong \overline{DC}$ and $\overline{AD} \cong \overline{BC}$	

Justify the following property of parallelograms:
The opposite angles of a parallelogram are congruent.



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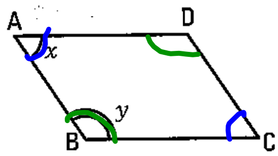


Jusitfy the steps proving the following property:
Consecutive angles of a parallelogram are supplementary.

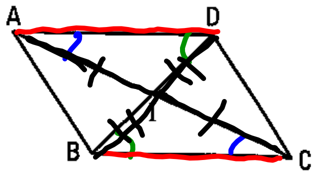
Let x and y represent the measures of angles A and B.

Statement	Justification
1. $m\angle A = m\angle C = x$	opposite ∠ of a ▱ are congruent
2. $m\angle B = m\angle D = y$	opposite ∠ of a ▱ are congruent
3. $m\angle A + m\angle B + m\angle C + m\angle D = 360°$	All interior ∠'s of a quadrilateral = 360°
4. $2x + 2y = 360°$	" "
5. $x + y = 180°$	adjacent sides in a quadrilateral = 180°

Justify the steps proving the following property:
The diagonals of a parallelogram bisect each other.

Hypothesis: – ABCD is a parallelogram.

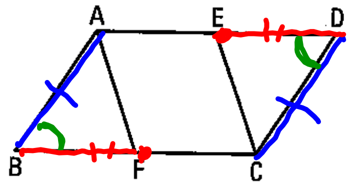
Consider the triangles ADI and CBI.



Statement	Justification
1. ∠DAI ≅ ∠BCI	AIA alternate interior Angles
2. ∠ADB ≅ ∠DBC	AIA
3. $\overline{AD} \cong \overline{BC}$	opposite side of ▱ ABCD are congruent
4. ΔADI ≅ ΔCBI	ASA
5. $\overline{IA} \cong \overline{IC}$	Corresponding sides on congruent Δ
6. $\overline{IB} \cong \overline{ID}$	" "

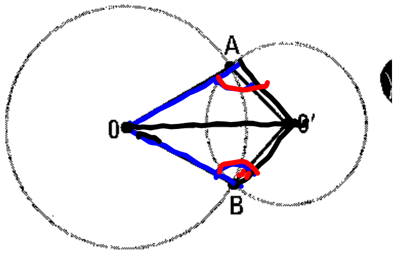
→ 4 rules

In the parallelogram on the right, E and F are the respective mid-points of sides AD and BC. Justify the steps proving that triangles ABF and CDE are congruent.



Statement	Justification
1. $\overline{AB} \cong \overline{CD}$	Opposite sides of a ▱ are congruent
2. $\angle ABC \cong \angle ADC$	opposite < of a ▱ are congruent
3. $\overline{BF} \cong \overline{DE}$	$\overline{AD} = \overline{BC}$ opposite sides of a ▱ E : F represent Mid point ∴ BF : DE are congruent
4. $\triangle ABF \cong \triangle CDE$	SAS

Two circles centered at 0 and 0′ intersect each other at two points A and B. Justify the steps proving that angles 0A0′ and 0B0′ are congruent.



Hypothesis:
- 0 and 0′ are the centres of two distinct circles.
- A and B are the intersection points of the two circles.

Consider the triangles 0A0′ and 0B0′.

Statement	Justification
1. $\overline{0A} \cong \overline{0B}$	$\overline{OA}$ & $\overline{OB}$ are radii in circle O
2. $\overline{0'A} \cong \overline{0'B}$	$\overline{O'A'}$ & O'B' are radii in circle O'
3. $\overline{00'} \cong \overline{00'}$	Shared side of Δ AOO' & Δ BOO'
4. $\Delta 0A0' \cong \Delta 0B0'$	SSS
5. $\angle 0A0' \cong \angle 0B0'$	Corresponding Angles in Congruent Δ