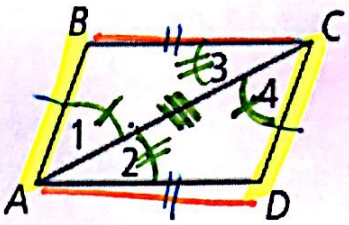
GUIDED NOTES: Proofs with Parallelograms

CPCTC – Corresponding Parts of Congruent Triangles are Congruent

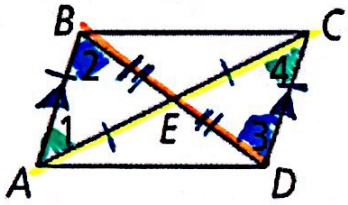
EX1. Given: ▱ABCD is a parallelogram.
Prove: AB ≅ CD and BC ≅ DA.



Statement	Reason
1. ABCD is a parallelogram	1. Given
2. $\overline{BC} \parallel \overline{DA}$	2. Definition of a parallelogram
3. $\angle 1 \cong \angle 4$, $\angle 3 \cong \angle 2$	3. Def. Alternate interior ∠'s
4. $AC \cong AC$	4. Reflexive Property
5. $\triangle ABC \cong \triangle CDA$	5. ASA
6. $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{DA}$	6. CPCTC

* Congruent Parts of Congruent Triangles are Congruent

EX2. Given: ▱ABCD is a parallelogram.
Prove: AC and BD bisect each other at E.

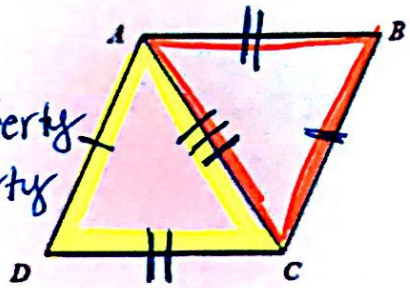


Statement	Reason
1. ABCD is a parallelogram	1. Given
2. AB ∥ DC	2. Def. of parallelogram
3. $\angle 1 \cong \angle 4$, $\angle 2 \cong \angle 3$	3. Def. Alternate Interior ∠'s
4. $AB \cong DC$	4. Opp. Sides congruent Property
5. $\triangle ABE \cong \triangle CDE$	5. ASA
6. $AE \cong CE$, $BE \cong DE$	6. CPCTC
7. AC and BD bisect each other at E	7. Definition of bisector

* Order matters because CPCTC!

EX3. Given □ABCD is a parallelogram.
Prove △DAC ≅ △BCA

Statement	Reason
1. ABCD is a parallelogram	1. Given
2. AD ≅ BC	2. Opp. sides congruent Property
3. AB ≅ CD	3. Opp. sides congruent Property
4 $\overline{AC} \cong \overline{CA}$	4. Reflexive Property
5. △DAC ≅ △BCA	5. SSS



EX4. Given <1 ≅ <2
<3 ≅ <4
Prove <A ≅ < C

Statement	Reason
1. <1 ≅ < 2	1. Given
2. <3 ≅ <4	2. Given
3. BD ≅ BD	3. Reflexive Property
4 △ABD ≅ △CDB	4. ASA
5. <A ≅ <C	5. CPCTC