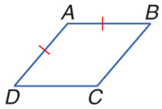
Properties of Parallelograms
Proof of Theorem 6.4

Prove that if a parallelogram has two consecutive sides congruent, it has four sides congruent.



Given: $\square ABCD$; $\overline{AD} \cong \overline{AB}$

Prove: $\overline{AD} \cong \overline{AB} \cong \overline{BC} \cong \overline{CD}$

Proof of Theorem 6.4

Proof:

Statements	Reasons
1.	1.
2.	2.
3.	3.
4.	4.

Prove that if AC **and** BD **are the diagonals of** $\square ABCD$, $\triangle BEC \cong \triangle DEA$ **and** $\triangle BEA \cong \triangle DEC$.

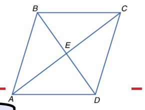
Given : $\square ABCD$

Prove : $\triangle BEC \cong \triangle DEA$

$\triangle BEA \cong \triangle DEC$

Choose which reason best completes the following proof.

Now, you try! Complete the Proof.



Proof:

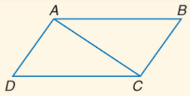
Statements	Reasons
1. ▱$ABCD$	1.
2. $\overline{BC} \cong \overline{DA}, \overline{AB} \cong \overline{CD}$	2.
3. $\angle ABD \cong \angle CDB, \angle BAC \cong \angle DCA$ $\angle CBD \cong \angle ADB, \angle BCA \cong \angle DAC$	3.
4. $\Delta BEC \cong \Delta DEA$, $\Delta BEA \cong \Delta DEC$	4.

THEOREM 6.8

Each diagonal of a parallelogram separates the parallelogram into two congruent triangles.

Abbreviation: *Diag. separates ▱ into 2 ≅ △s.*

Example: $\triangle ACD \cong \triangle CAB$



THEOREM 6.13

If a parallelogram is a rectangle, then the diagonals are congruent.

Abbreviation: *If ▱ is rectangle, diag. are ≅.*

$\overline{AC} \cong \overline{BD}$