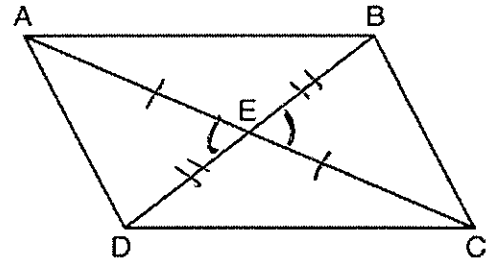


Quadrilateral Proofs

(Answer Key)

Given: Quadrilateral $ABCD$ is a parallelogram with diagonals AC and BD intersecting at E

Prove: $\triangle AED \cong \triangle CEB$



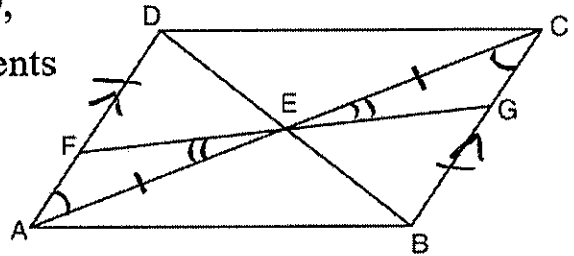
S	R
1) Parallelogram ABCD	1) Given
2) $\overline{AE} \cong \overline{CE}$, $\overline{DE} \cong \overline{BE}$	2) Diagonals of a parallelogram bisect each other
3) $\angle AED \cong \angle CEB$	3) Vertical \angle 's are \cong
4) $\triangle AED \cong \triangle CEB$	4) SAS

Describe a single rigid motion that maps $\triangle AED$ onto $\triangle CEB$.

180° Rotation about point E

Quadrilateral Proofs

In the diagram below of quadrilateral $ABCD$,
 $\overline{AD} \cong \overline{BC}$ and $\angle DAE \cong \angle BCE$. Line segments
 AC , DB , and FG intersect at E .



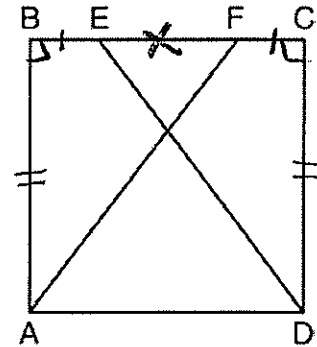
Prove: $\triangle AEF \cong \triangle CEG$

- S
-
- 1) $\overline{AD} \cong \overline{BC}$, $\angle DAE \cong \angle BCE$
 - 2) $\overline{AD} \parallel \overline{BC}$
 - 3) $ABCD$ is a parallelogram
 - 4) $\overline{AE} \cong \overline{CE}$
 - 5) $\angle FEA \cong \angle GEC$
 - 6) $\triangle AEF \cong \triangle CEG$

- R
-
- 1) Given
 - 2) When alt int \angle 's \cong , lines are \parallel
 - 3) A quad. w/ one pair of opp. sides \cong and \parallel is a parallelogram
 - 4) Diagonals of a parallelogram bisect each other
 - 5) Vertical \angle 's are \cong
 - 6) ASA

Quadrilateral Proofs

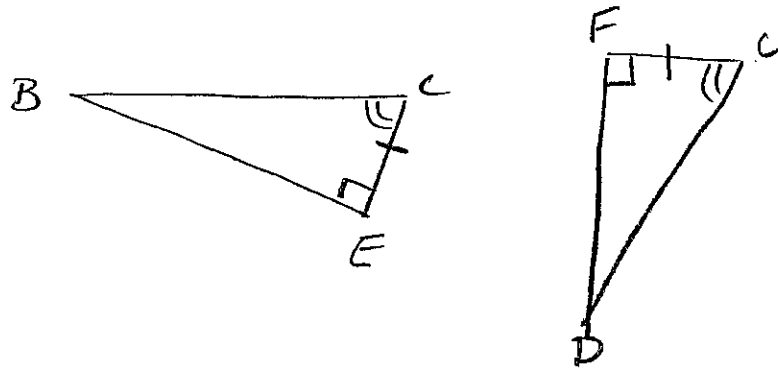
The diagram below shows square $ABCD$ where E and F are points on \overline{BC} such that $\overline{BE} \cong \overline{FC}$, and segments \overline{AF} and \overline{DE} are drawn.



Prove that $\overline{AF} \cong \overline{DE}$

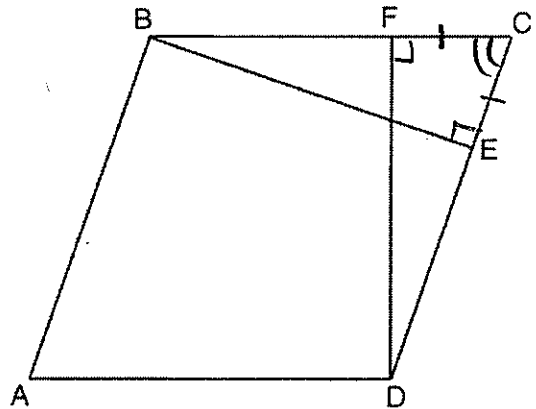
S	R
1) Square $ABCD$, $\overline{BE} \cong \overline{FC}$	1) Given
2) $\overline{EF} \cong \overline{EF}$	2) Reflexive
3) $\overline{BE} + \overline{EF} \cong \overline{EF} + \overline{FC}$	3) Addition
4) $\overline{BF} \cong \overline{EC}$	4) Partition (whole equal to sum of its parts)
5) $\angle B$ + $\angle C$ are right \angle 's	5) A square has 4 right \angle 's
6) $\angle B \cong \angle C$	6) Right \angle 's are \cong
7) $\overline{AB} \cong \overline{DC}$	7) A square has 4 \cong sides
8) $\triangle ABF \cong \triangle DCE$	8) SAS
9) $\overline{AF} \cong \overline{DE}$	9) CPCTC

Quadrilateral Proofs



In the diagram of parallelogram $ABCD$ below,
 $\overline{BE} \perp \overline{CD}$, $\overline{DF} \perp \overline{BC}$, $\overline{CE} \cong \overline{CF}$.

Prove $ABCD$ is a rhombus.



S	R
1) Parallelogram $ABCD$ $\overline{BE} \perp \overline{CD}$, $\overline{DF} \perp \overline{BC}$, $\overline{CE} \cong \overline{CF}$	1) Given
2) $\angle BEC$ + $\angle DFC$ are right angles	2) \perp lines form right \angle 's
3) $\angle BEC \cong \angle DFC$	3) Right \angle 's are \cong
4) $\angle C \cong \angle C$	4) Reflexive property
5) $\triangle BEC \cong \triangle DFC$	5) ASA
6) $\overline{BC} \cong \overline{DC}$	6) $\angle P \cong \angle C$
7) $ABCD$ is a rhombus	7) A parallelogram with one pair of \cong adjacent sides is a rhombus