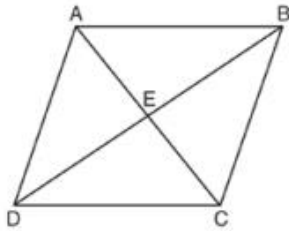


Aim: How can we prove quadrilaterals are parallelograms?

Do Now:

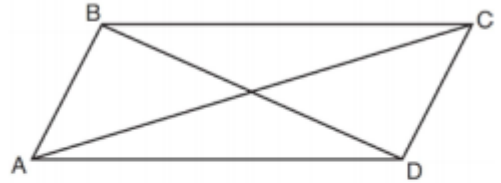
1. Parallelogram $ABCD$ with diagonals \overline{AC} and \overline{BD} intersecting at E is shown below.



Which statement must be true?

- 1) $\overline{BE} \cong \overline{CE}$
- 2) $\angle BAE \cong \angle DCE$
- 3) $\overline{AB} \cong \overline{BC}$
- 4) $\angle DAE \cong \angle CBE$

2. Quadrilateral $ABCD$ with diagonals \overline{AC} and \overline{BD} is shown in the diagram below.



Which information is *not* enough to prove $ABCD$ is a parallelogram?

- 1) $\overline{AB} \cong \overline{CD}$ and $\overline{AB} \parallel \overline{DC}$
- 2) $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \cong \overline{DA}$
- 3) $\overline{AB} \cong \overline{CD}$ and $\overline{BC} \parallel \overline{AD}$
- 4) $\overline{AB} \parallel \overline{DC}$ and $\overline{BC} \parallel \overline{AD}$

How can we prove a quadrilateral is a parallelogram?

Show...

1.

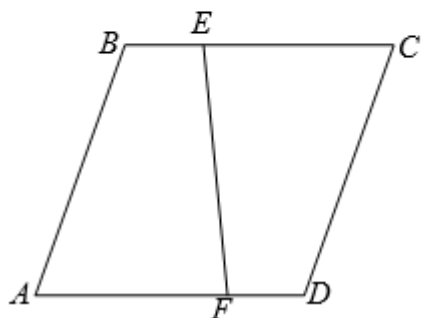
OR

Show...

2.

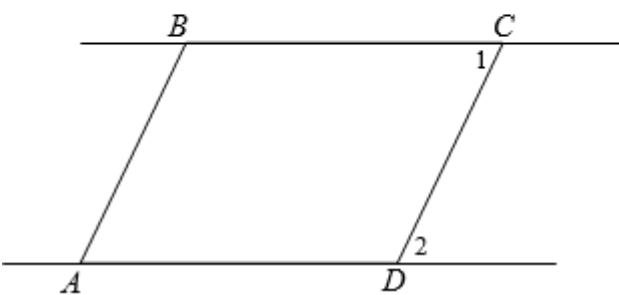
- 1) Given: $\overline{AB} \cong \overline{CD}$,
 $\overline{BE} \cong \overline{FD}$,
 $\overline{EC} \cong \overline{AF}$

Prove: $ABCD$ is a parallelogram.



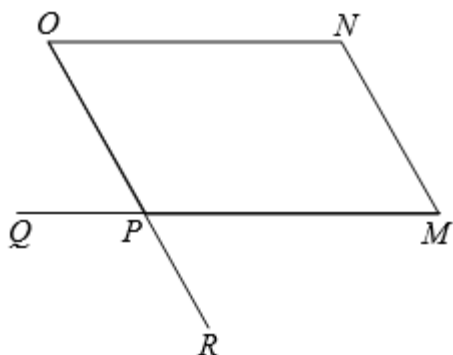
- 2) Given: $\overline{AB} \parallel \overline{CD}$,
 $\angle 1 \cong \angle 2$

Prove: $ABCD$ is a parallelogram.



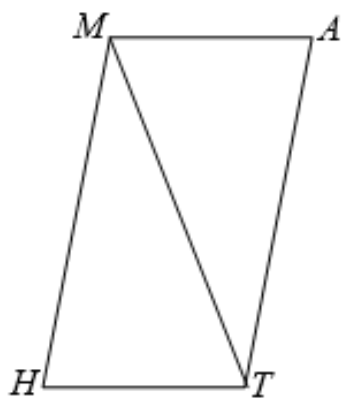
- 3) Given: $\angle O \cong \angle M$,
 $\angle QPR \cong \angle ONM$

Prove: $MNOP$ is a parallelogram.



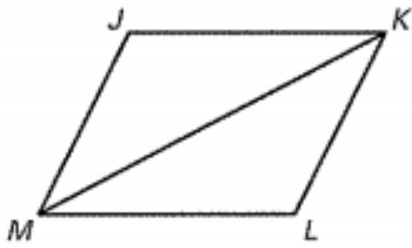
- 4) Given: $\overline{MA} \cong \overline{HT}$,
 $\angle AMT \cong \angle HTM$

Prove: $MATH$ is a parallelogram.



5) **Given:** $\triangle MJK \cong \triangle KLM$

Prove: $MJKL$ is a parallelogram.



CHALLENGE

Given: Quadrilateral $ABCD$, diagonal \overline{AFEC} ,
 $\overline{AE} \cong \overline{FC}$, $\overline{BF} \perp \overline{AC}$, $\overline{DE} \perp \overline{AC}$, $\angle 1 \cong \angle 2$

Prove: $ABCD$ is a parallelogram.

