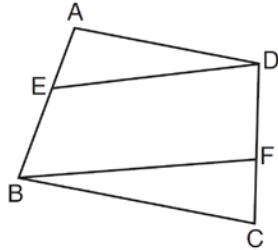


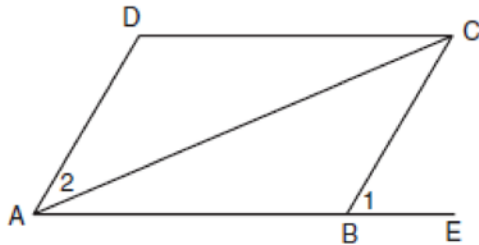
G.CO.C.11: Quadrilateral Proofs

- 1 In the diagram below of quadrilateral $ABCD$, E and F are points on \overline{AB} and \overline{CD} , respectively, $\overline{BE} \cong \overline{DF}$, and $\overline{AE} \cong \overline{CF}$.



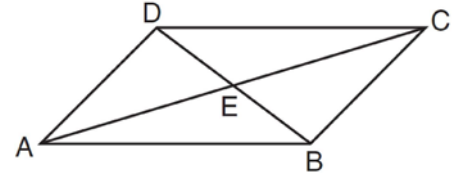
Which conclusion can be proven?

- 1) $\overline{ED} \cong \overline{FB}$
 - 2) $\overline{AB} \cong \overline{CD}$
 - 3) $\angle A \cong \angle C$
 - 4) $\angle AED \cong \angle CFB$
- 2 Given: parallelogram $ABCD$, diagonal \overline{AC} , and \overline{ABE}



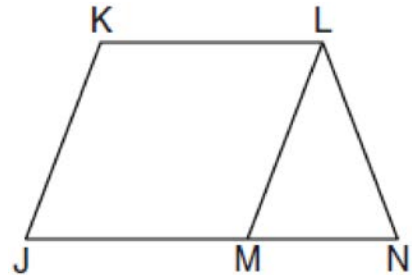
Prove: $m\angle 1 > m\angle 2$

- 3 In parallelogram $ABCD$ shown below, diagonals \overline{AC} and \overline{BD} intersect at E .

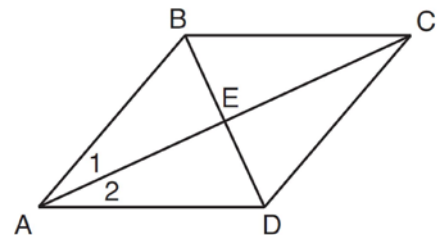


Prove: $\angle ACD \cong \angle CAB$

- 4 Given: \overline{JKLM} is a parallelogram.
 $\overline{JM} \cong \overline{LN}$
 $\angle LMN \cong \angle LNM$
Prove: $JKLM$ is a rhombus.



- 5 Given: Quadrilateral $ABCD$ with diagonals \overline{AC} and \overline{BD} that bisect each other, and $\angle 1 \cong \angle 2$



Prove: $\triangle ACD$ is an isosceles triangle and $\triangle AEB$ is a right triangle

G.CO.C.11: Quadrilateral Proofs

Answer Section

1 ANS: 2 REF: 011411ge

2 ANS:

Because $ABCD$ is a parallelogram, $\overline{AD} \parallel \overline{CB}$ and since \overline{ABE} is a transversal, $\angle BAD$ and $\angle 1$ are corresponding angles and congruent. If $m\angle BAD > m\angle 2$, then $m\angle 1 > m\angle 2$, using substitution.

REF: 060533b

3 ANS:

Parallelogram $ABCD$, diagonals \overline{AC} and \overline{BD} intersect at E (given). $\overline{DC} \parallel \overline{AB}$; $\overline{DA} \parallel \overline{CB}$ (opposite sides of a parallelogram are parallel). $\angle ACD \cong \angle CAB$ (alternate interior angles formed by parallel lines and a transversal are congruent).

REF: 081528geo

4 ANS:

$\overline{JK} \cong \overline{LM}$ because opposite sides of a parallelogram are congruent. $\overline{LM} \cong \overline{LN}$ because of the Isosceles Triangle Theorem. $\overline{LM} \cong \overline{JM}$ because of the transitive property. $JKLM$ is a rhombus because all sides are congruent.

REF: 011036ge

5 ANS:

Quadrilateral $ABCD$ with diagonals \overline{AC} and \overline{BD} that bisect each other, and $\angle 1 \cong \angle 2$ (given); quadrilateral $ABCD$ is a parallelogram (the diagonals of a parallelogram bisect each other); $\overline{AB} \parallel \overline{CD}$ (opposite sides of a parallelogram are parallel); $\angle 1 \cong \angle 3$ and $\angle 2 \cong \angle 4$ (alternate interior angles are congruent); $\angle 2 \cong \angle 3$ and $\angle 3 \cong \angle 4$ (substitution); $\triangle ACD$ is an isosceles triangle (the base angles of an isosceles triangle are congruent); $\overline{AD} \cong \overline{DC}$ (the sides of an isosceles triangle are congruent); quadrilateral $ABCD$ is a rhombus (a rhombus has consecutive congruent sides); $\overline{AE} \perp \overline{BE}$ (the diagonals of a rhombus are perpendicular); $\angle BEA$ is a right angle (perpendicular lines form a right angle); $\triangle AEB$ is a right triangle (a right triangle has a right angle).

REF: 061635geo