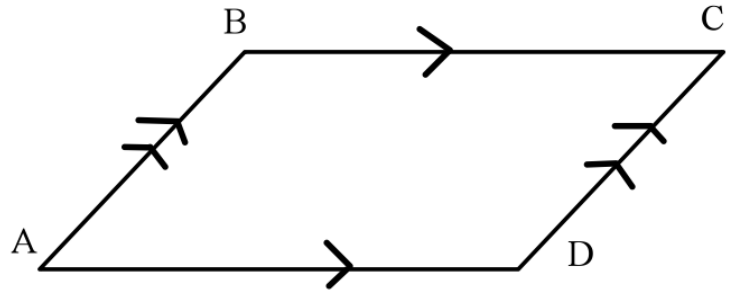


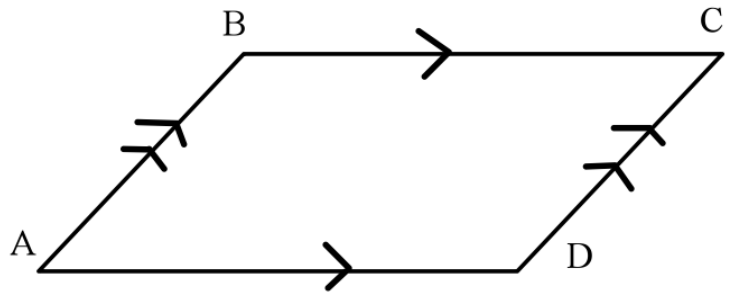
Name: _____
Period: _____ Date: _____

4. Examine each of the following. If a conjecture can be proven, write a two-column proof. If it cannot, provide a detailed counterexample.

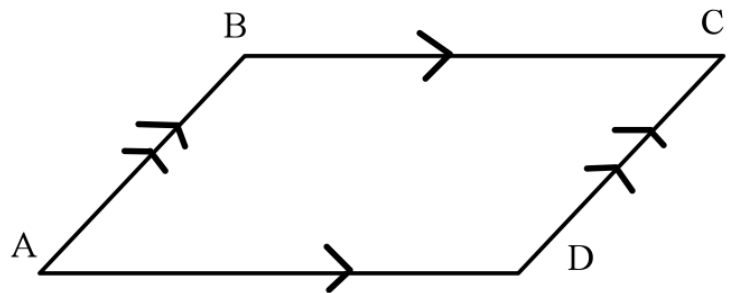
- a. *Given:* Parallelogram ABCD
Prove: Opposite angles are congruent
($\angle A \cong \angle C$, $\angle B \cong \angle D$)



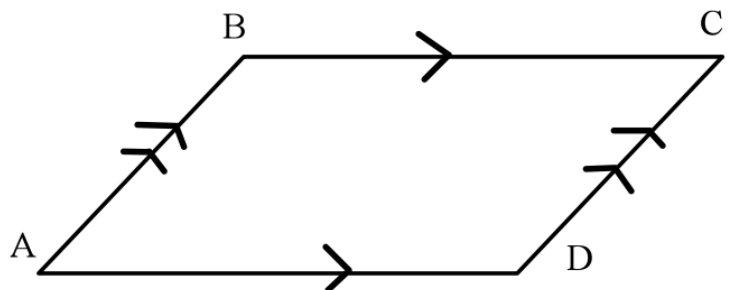
- b. *Given:* Parallelogram ABCD
Prove: Opposite sides are congruent
($\overline{AB} \cong \overline{DC}$, $\overline{AD} \cong \overline{BC}$)



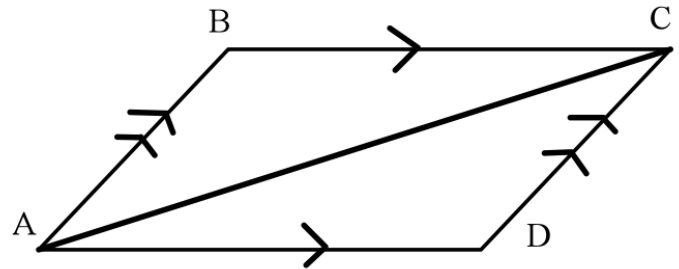
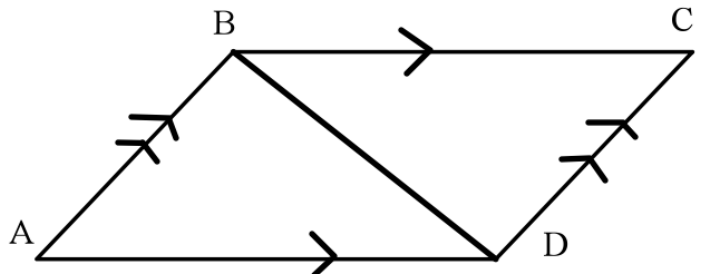
- c. *Given:* Parallelogram ABCD
Prove: Adjacent angles are supplementary
($m\angle A + m\angle D = 180$, $m\angle B + m\angle C = 180$)



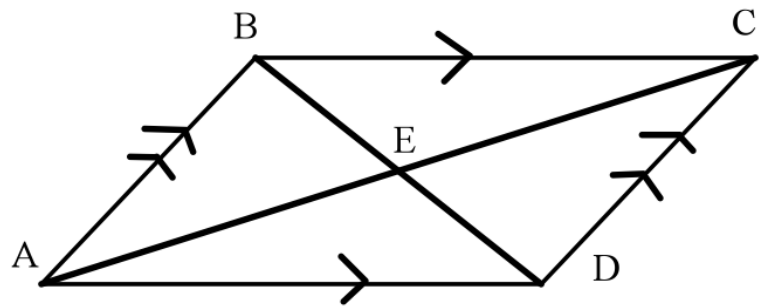
- d. *Given:* Parallelogram ABCD
Prove: All angles are congruent
($\angle A \cong \angle C \cong \angle B \cong \angle D$)



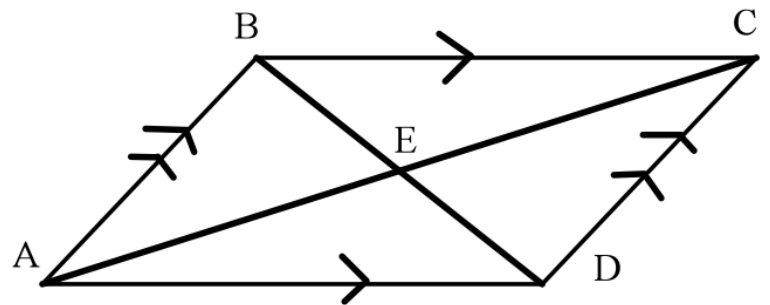
- e. *Given:* Parallelogram ABCD
Prove: Each diagonal divides the shape into two congruent triangles
 ($\triangle ABD \cong \triangle CBD, \triangle ABC \cong \triangle CDA$)



- f. *Given:* Parallelogram ABCD
Prove: Diagonals bisect each other
 ($\overline{AE} \cong \overline{EC}, \overline{BE} \cong \overline{ED}$)



- g. *Given:* Parallelogram ABCD
Prove: Diagonals are congruent
 ($\overline{AC} \cong \overline{BD}$)



- h. *Given:* Parallelogram ABCD
Prove: Diagonals are perpendicular
 ($\overline{AC} \perp \overline{BD}$)

