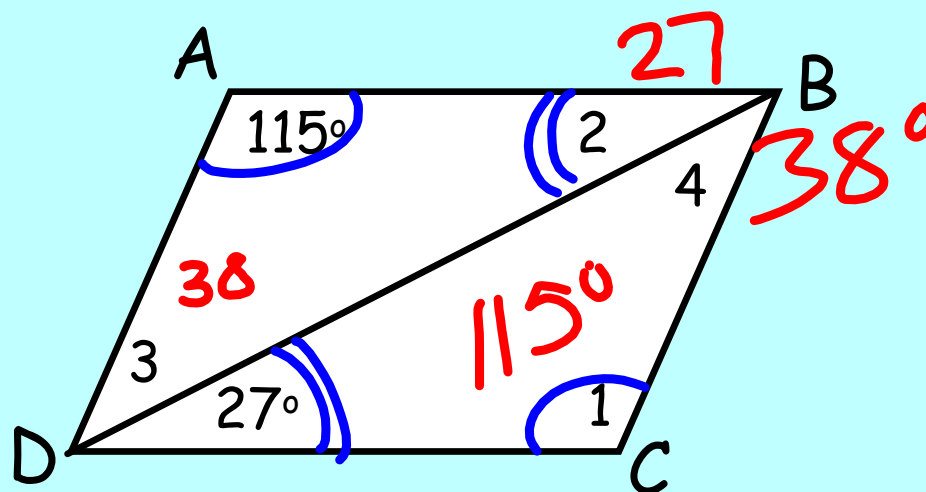


# 12/10/19 - Warm Up Problem

Quadrilateral ABCD is a parallelogram. Find the measure of each numbered angle.



## Concept 15 - Show that a Quadrilateral is a Parallelogram

**Goal:** determine if a quadrilateral is a parallelogram and explain your reasoning

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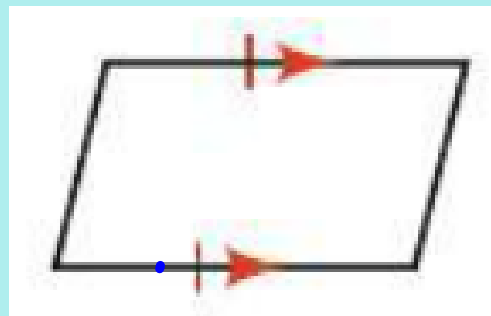
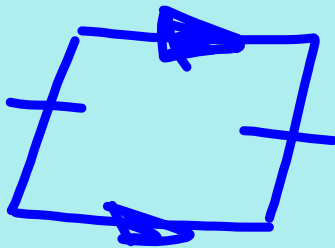
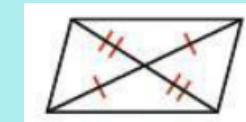
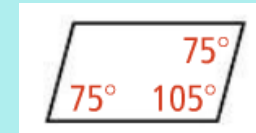
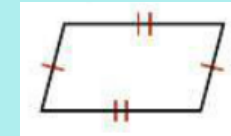
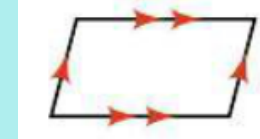
"Sculpture for a Large Wall" by Ellsworth Kelly

65 feet long - 11 feet high - 2 feet deep

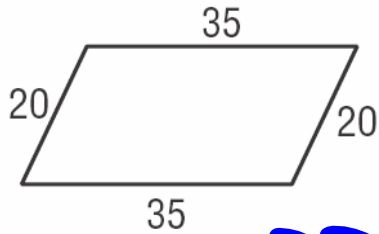
Some of the panels used in this sculpture appear to be quadrilaterals. How can you tell that they are parallelograms? What characteristic do you look for?

If any one of these is true, then the quadrilateral is a parallelogram...

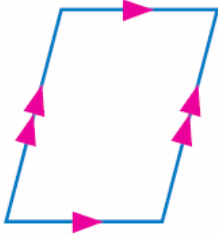
- 1) Both Pairs of Opposite Sides are Parallel
- 2) Both Pairs of Opposite Sides are Congruent
- 3) Consecutive Angles are Supplementary
- 4) Both Pairs of Opposite Angles are Congruent
- 5) Diagonals Bisect Each Other
- 6) One Pair of Sides is Both Parallel and Congruent



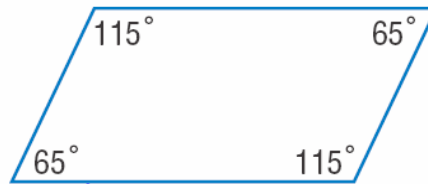
Determine whether the quadrilateral is a parallelogram.  
Justify your answer.



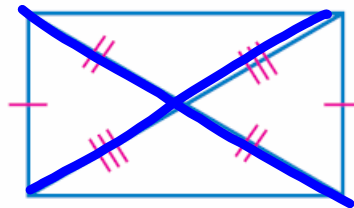
Yes - opp. sides  $\parallel$



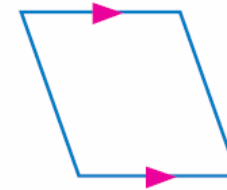
Yes - opp. sides  $\parallel$



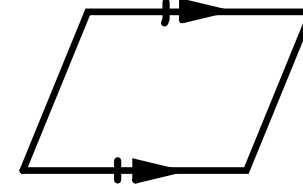
Yes - opp.  $\angle$ s  $\parallel$



Yes - diagonals bisect

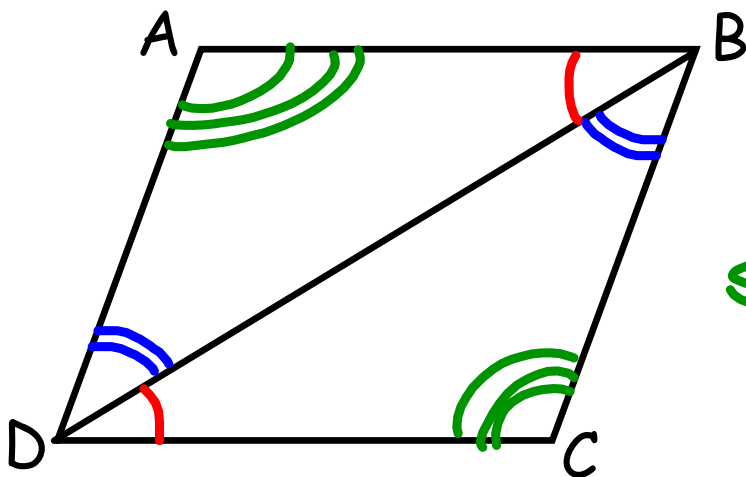


No - only one pair of sides  $\parallel$



Yes - opp. sides  $\parallel$

Describe how you could prove that the quadrilateral is a parallelogram.



$\angle A \cong \angle C$   
Third Angle Thm  
SO, opp. angles  
are congruent

**Assignment:**

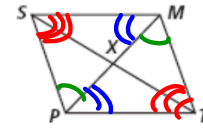
Finish Concept 15 Worksheet

- due Friday 12/13

PROVING A QUADRILATERAL IS A PARALLELOGRAM

Is the given information enough to prove that SPTM is a parallelogram? If it is, state how you know it is a parallelogram.

15.  $\angle SPT \cong \angle SMT$       16.  $\angle SPX \cong \angle TMX, \angle TPX \cong \angle SMP$   
 No - only 1 pair of  $\cong$  angles      Yes -  $\angle S \cong \angle T$  3rd angle thm.  
 Opp.  $\angle s \cong$
17.  $\overline{SM} \cong \overline{PT}, \overline{SP} \cong \overline{MT}$       18.  $\overline{SX} \cong \overline{XT}, \overline{SM} \cong \overline{PT}$
19.  $\overline{PX} \cong \overline{MX}, \overline{SX} \cong \overline{TX}$       21.  $\overline{SP} \cong \overline{MT}, \overline{SP} \parallel \overline{MT}$



Decide whether the quadrilateral is a parallelogram. State your reasoning.

21.      22.      23.      24.

Describe how you could prove that quadrilateral ABCD is a parallelogram.

25.      26.

Draw point D in each diagram so that Quadrilateral ABCD is a parallelogram.

27.      28.

## Attachments

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