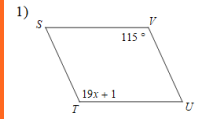


Today we will learn

Converse of Parallelogram Properties

Special Type of Parallelogram

White Board Problem
Solve for x.



Opp \angle 's \cong

$$19x + 1 = 115$$

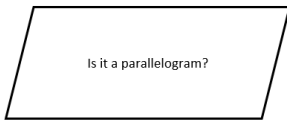
$$19x = 114$$

$$x = 6$$

Converse of Parallelogram Properties

Conditional Statement - An "If... then..." statement.

Converse - Switching the hypothesis and conclusion of a conditional statement

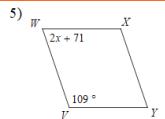


- 1.
- 2.
- 3.
- 4.
- 5.

How do you prove a quadrilateral is a PARALLELOGRAM?

By using Converse properties

White Board Problem
What is the value of x.

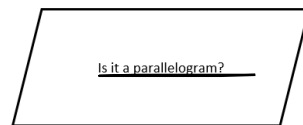





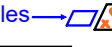

Consecutive \angle 's Supplementary

$$2x + 71 + 109 = 180$$

$$2x + 180 = 180$$

$$2x = 0$$

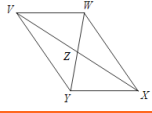
$$x = 0$$


1. If 1 pair of opp. sides are \parallel and $\cong \rightarrow \square$ 
2. If both pairs of opp. sides are $\cong \rightarrow \square$ 
3. If both pairs of opp. angles are $\cong \rightarrow \square$ 
4. If 1 angle is supp. to both consecutive angles $\rightarrow \square$ 
5. If diagonals bisect each other $\rightarrow \square$ 

Let's apply these converse properties

White Board Problem
Solve for x.

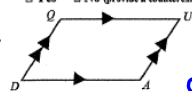
3) $WY = 22$
 $ZY = 2x + 1$



$22 = 2(2x+1)$
 $22 = 4x+2$
 $20 = 4x$
 $5 = x$

Practice with Converse Properties of Parallelograms
What is expected?

1) Will this always form a parallelogram?
 Yes No (provide a counterexample)

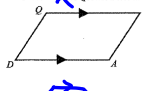


yes because both pairs of opposite sides are \parallel

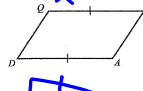
Complete problems 2-6

Review the answers

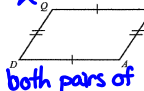
2) Will this always form a parallelogram? Yes No (provide a counterexample)



3) Will this always form a parallelogram? Yes No (provide a counterexample)

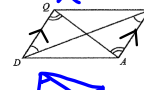


4) Will this always form a parallelogram? Yes No (provide a counterexample)

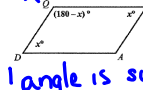


both pairs of opp. sides \cong

5) Will this always form a parallelogram? Yes No (provide a counterexample)



6) Will this always form a parallelogram? Yes No (provide a counterexample)



1 angle is supplementary to both consecutive \angle 's

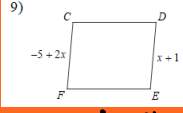
Converse Properties of Parallelograms

- We can use the Converse of each property to prove a quadrilateral is a parallelogram.
- If both pairs of opposite sides of a quadrilateral are congruent then it is a parallelogram.
- If both pairs of opposite angles of a quadrilateral are congruent then it is a parallelogram.
- If 1 angle of a quadrilateral is supplementary to both of its consecutive angles, then it is a parallelogram.
- If 1 pair of opposite sides are parallel and congruent then it is a parallelogram.
- If diagonals of a quadrilateral bisect each other, then it is a parallelogram.

End for recap

White Board Problem
Find the value of x.

9)



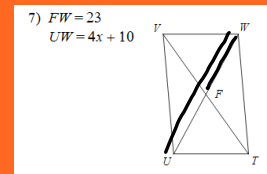
Opp. sides \cong

$x+1 = -5+2x$
 $x+6 = 2x$
 $6 = x$

Now that we have SOOOO much information about parallelograms, we need to look at a special parallelogram.

White board Problem.

Find the value of x.



$$\begin{aligned} 2(23) &= 4x + 10 \\ 46 &= 4x + 10 \\ 36 &= 4x \\ 9 &= x \end{aligned}$$

A type of special quadrilateral is a rectangle. A rectangle is a quadrilateral with four right angles.

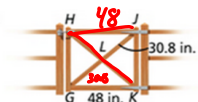
THEOREM	HYPOTHESIS
If a quadrilateral is a rectangle, then it is a parallelogram. (rect. \rightarrow \square)	
If a parallelogram is a rectangle, then its diagonals are congruent. (rect. \rightarrow diags. \cong)	

Rhombus: All sides \cong , diagonals bisect angles and are \perp
 Square: All features of Rectangle and Rhombus

Carpentry The rectangular gate has diagonal braces. Find each length.

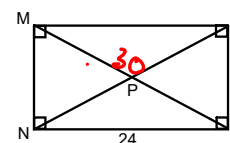
1a. HJ
48 in.

1b. HK
 $2(30.8)$
61.6 in.



0

MNOL is a rectangle.
 What are the lengths of \overline{ML} and \overline{MP}
 if $m\angle NO = 30$



$$\begin{aligned} \overline{ML} &= 30 \\ \overline{MP} &= 15 \end{aligned}$$

*BONUS: What is the length of \overline{OL} ?

right triangles M 24 O
 30 L

$$\begin{aligned} 24^2 + x^2 &= 30^2 \\ x &= 18 \end{aligned}$$

$$\begin{aligned} 576 + x^2 &= 900 \\ x^2 &= 324 \\ x &= 18 \end{aligned}$$

Sticky Note Check

March 14, 2018