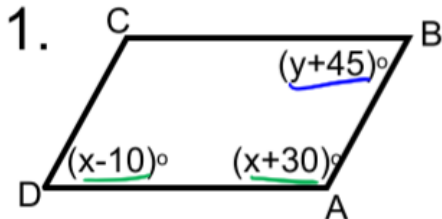


Warm Up

The following shapes are parallelograms.
Find the value of each variable. Identify what parallelogram property you used.



$$\begin{aligned} x-10 + x+30 &= 180 \\ 2x+20 &= 180 \end{aligned}$$

$$2x = 160$$

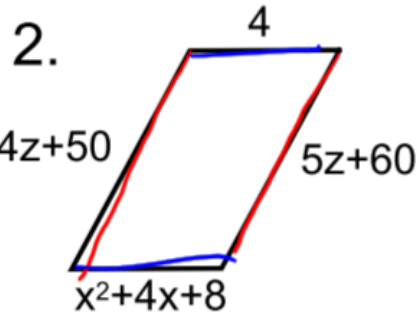
$$\boxed{x = 80}$$

→ consecutive \angle 's Supp.

$$\begin{aligned} x+30 + y+45 &= 180 \\ (80)+30 + y+45 &= 180 \end{aligned}$$

$$155 + y = 180$$

$$\boxed{y = 25}$$



$$4z+50 = 5z+60$$

$$50 = z + 60$$

$$\boxed{-10 = z}$$

$$x^2+4x+8 = 4$$

$$x^2+4x+4 = 0 \quad \frac{4}{2} \div 2$$

$$(x+2)(x+2) = 0$$

$$x+2=0 \quad x+2=0$$

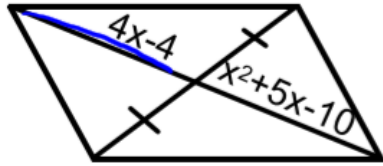
$$\boxed{x = -2 \quad x = -2}$$

→ opp. sides \cong
 → opp sides \cong

Goals for today

- More practice with parallelogram property application
- Practice with parallelogram proofs

Ex. 1 Find the value of x that would make ABCD a parallelogram.



$$4x - 4 = x^2 + 5x - 10$$

$$\begin{array}{r} 4x - 4 \\ +4 \\ \hline 4x = x^2 + 5x - 6 \\ -4x \\ \hline 0 = x^2 + x - 6 \end{array}$$

$$0 = x^2 + x - 6$$

$$0 = (x+3)(x-2)$$

$$x+3 = 0 \quad x-2 = 0$$

$$x = -3 \quad x = 2$$

Check $4(-3) - 4 = -16$ NO
 $4(2) - 4 = 4$ YES Substitute in.

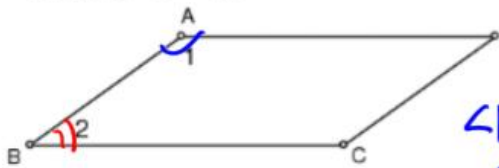
which one?

Explain why this value would make ABCD a parallelogram.

A parallelogram's diagonals bisect each other. When $x=2$ this creates a value where the diagonal would be bisected.

Ex. 2 Given: ABCD is Parallelogram
 $m\angle 1 = 110$

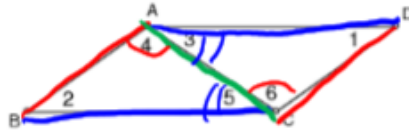
Prove: $m\angle 2 = 70$



Statement	Reason
ABCD is \square	Given
$m\angle 1 = 110^\circ$	Given
$\angle 1$ and $\angle 2$ supp.	$\square \rightarrow$ consecutive \angle 's supp.
$m\angle 1 + m\angle 2 = 180^\circ$	Def. of Supp.
$110^\circ + m\angle 2 = 180^\circ$	substitution
$m\angle 2 = 70$	Inverse Property of addition

Ex. 3 Given: ABCD is Parallelogram
 Prove: $\angle 1 \cong \angle 2$

Do not prove using opposite angles in Parallelogram are congruent theorem



Statement	Reason
ABCD is \square	Given
$AD \parallel BC$ + $AB \parallel DC$	Def. of \square
$\angle 4 \cong \angle 6$ + $\angle 3 \cong \angle 5$	Alt. Int. \angle 's Thm.
$AC \cong CA$	Reflexive Prop.
$\triangle ABC \cong \triangle CDA$	ASA
$\angle 1 \cong \angle 2$	CPCTC

Find the value of x, is $m\angle 1 = 5x - 11$ and $m\angle 2 = 2x + 25$
 $m\angle 1 = m\angle 2$

$$5x - 11 = 2x + 25$$

$$3x - 11 = 25$$

$$3x = 36$$

$$x = 12$$

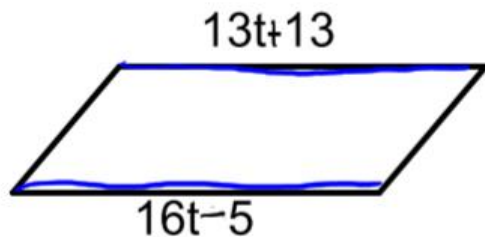
Review of what you learned.

What are the five properties of parallelograms?

1. $\square \rightarrow$ opp. sides \parallel
2. $\square \rightarrow$ opp. sides \cong
3. $\square \rightarrow$ opp. \angle 's \cong
4. $\square \rightarrow$ consecutive \angle 's supplementary.
5. $\square \rightarrow$ Diagonals bisect each other.

Identify the property that you would apply to find the value t . Then find the value of t .

Property: $\square \rightarrow$ opp. sides \cong



$$\begin{aligned} 13t+13 &= 16t-5 \\ 13 &= 3t-5 \\ 18 &= 3t \\ t &= 6 \end{aligned}$$