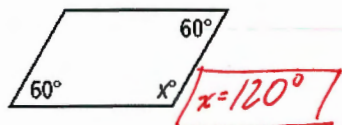


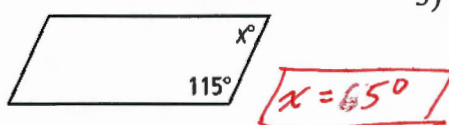
6.2 – Properties of Parallelograms

Find the value of x in each parallelogram.

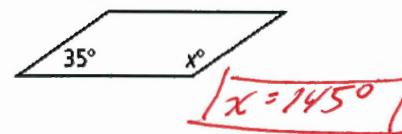
1)



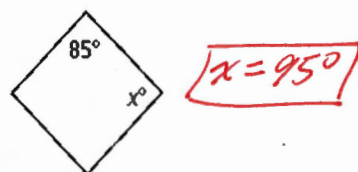
2)



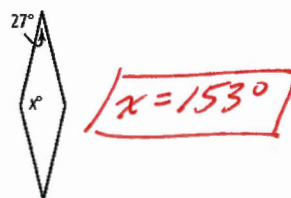
3)



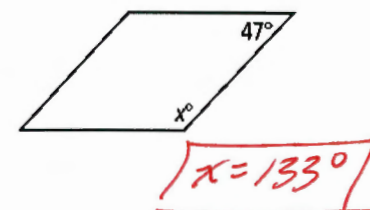
4)



5)



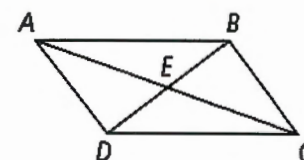
6)



Algebra Find the values for x and y in parallelogram $ABCD$.

7) $AE = 3x$, $EC = 2y - 2$, $DE = 5x$, $EB = 2y + 2$

$$\begin{aligned} 3x &= 2y - 2 & \rightarrow & 3x - 2y = -2 \\ 5x &= 2y + 2 & \rightarrow & 5x - 2y = 2 \\ \hline -2x & & & = -4 \\ x &= 2 \\ y &= 4 \end{aligned}$$



8) $AE = 2x$, $EC = y + 4$, $DE = x$, $EB = 2y - 1$

$$\begin{aligned} 2x &= y + 4 & \rightarrow & 2x - y = 4 & \rightarrow & -4x + 2y = -8 \\ x &= 2y - 1 & \rightarrow & x - 2y = -1 \\ \hline -3x & & & = -9 \\ x &= 3 \\ y &= 2 \end{aligned}$$

9) $AE = 4x$, $EC = 5y - 2$, $DE = 2x$, $EB = y + 14$

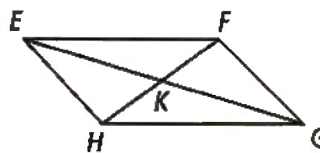
$$\begin{aligned} 4x &= 5y - 2 & \rightarrow & 4x - 5y = -2 & \rightarrow & 4x - 5y = -2 \\ 2x &= y + 14 & \rightarrow & 2x - y = 14 & \rightarrow & -4x + 2y = -28 \\ \hline -3y & & & = -30 \\ y &= 10 \\ x &= 12 \end{aligned}$$

10) Write a two-column proof.

Given: Parallelogram $EFGH$, with diagonals

$\overline{EG}$ and $\overline{HF}$

Prove: $\triangle EFK \cong \triangle GHK$



Statement	Reasons
1. $\text{llgram } EFGH \text{ w/ diagonals } \overline{EG} + \overline{HF}$	<i>Given</i>
2. $\overline{EK} \cong \overline{GK}$	Diagonals of a parallelogram bisect each other
3. $\overline{HK} \cong \overline{FK}$	Diagonals of a parallelogram bisect each other
4. $\overline{EF} \cong \overline{GH}$	<i>Opposite Sides Theorem</i>
5. $\triangle EFK \cong \triangle GHK$	<i>SSS</i>

In the figure, $TU = UV$. Find each length.

(we really didn't go over this...)

11) NM

4.5

12) QR

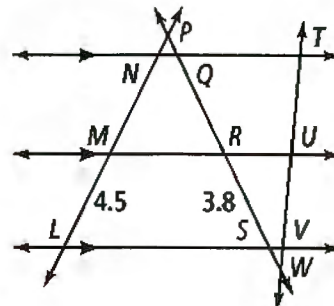
3.8

13) LN

9

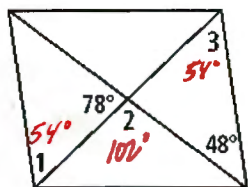
14) QS

7.6

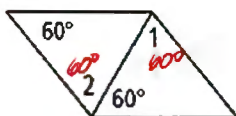


Find the measures of the numbered angles for each parallelogram.

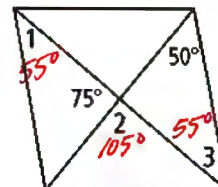
15)



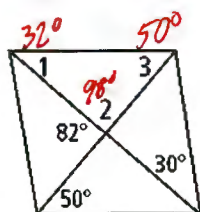
16)



17)



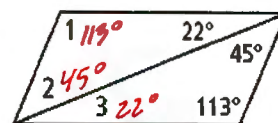
18)



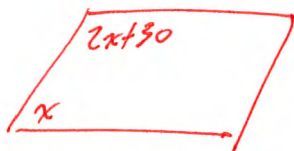
19)



20)



- 21) The measure of one interior angle of a parallelogram is 30° more than two times the measure of another angle. Find the measure of each angle of the parallelogram.



$$2x + 30 + x = 180$$

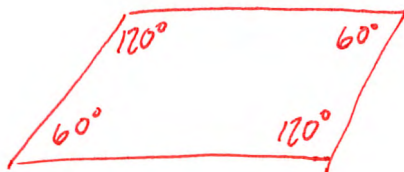
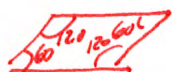
$$3x + 30 = 180$$

$$3x = 150$$

$$x = 50$$

$$50^\circ, 50^\circ, 130^\circ, 130^\circ$$

- 22) Your friend claims that you can prove that two parallelograms are congruent by proving that they have two pairs of congruent opposite angles. Is your friend correct? Explain your reasoning.



They don't have to be congruent. They can be similar!

- 23) State whether each statement is *always*, *sometimes*, or *never* true for a parallelogram.

- a. The opposite sides are congruent.

Always

- b. All four sides are congruent.

Sometimes

- c. The diagonals are congruent.

Sometimes



- d. The opposite angles are congruent.

Always

- e. The adjacent angles are congruent.

Sometimes



- f. The adjacent angles are complementary.

Never