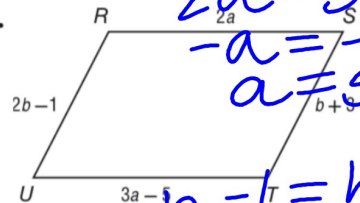


**ALGEBRA** Find the value of each variable.

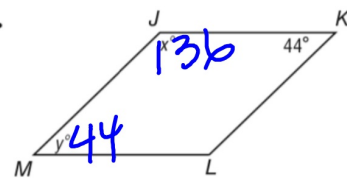
1.



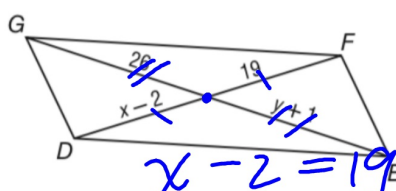
$$\begin{aligned} 2a &= 3a - 5 \\ -a &= -5 \\ a &= 5 \end{aligned}$$

$$\begin{aligned} 2b - 1 &= b + 3 \\ b &= 4 \end{aligned}$$

2.

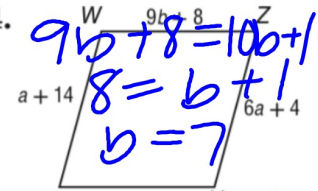


3.



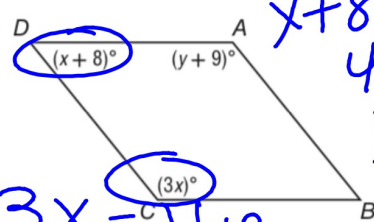
$$\begin{aligned} x - 2 &= 19 \\ x &= 21 \\ y + 1 &= 26 \\ y &= 25 \end{aligned}$$

4.



$$\begin{aligned} 9b + 8 &= 10b + 1 \\ 8 &= b + 1 \\ b &= 7 \\ a + 14 &= 6a + 4 \\ 14 &= 5a + 4 \\ 10 &= 5a \\ a &= 2 \end{aligned}$$

5.



$$\begin{aligned} x + 8 + 3x &= 180 \\ 4x &= 172 \\ x &= 43 \end{aligned}$$

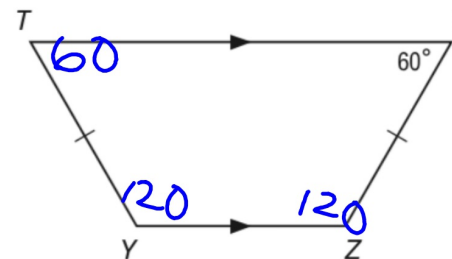
$$\begin{aligned} 3x &= y + 9 \\ 129 &= y + 9 \\ y &= 120 \end{aligned}$$

c.

$$\begin{aligned} 4x - 2 &= x + 10 \\ 3x &= 12 \\ x &= 4 \\ y + 5 &= 3y - 1 \\ 5 &= 2y - 1 \\ 6 &= 2y \\ y &= 3 \end{aligned}$$

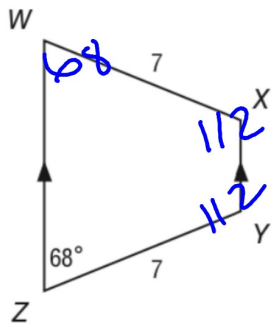
**Find each measure.**

1.  $m\angle T$

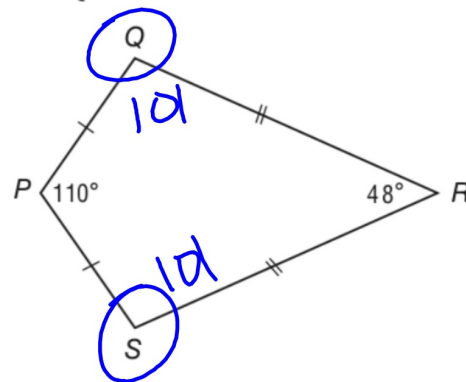


$$\begin{aligned} 180(n-2) \\ 180(4-2) \\ 180(2) \\ = 360 \end{aligned}$$

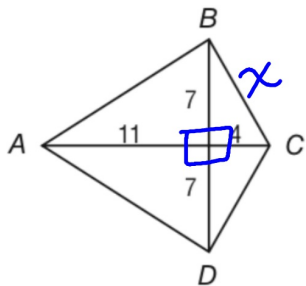
2.  $m\angle Y$



3.  $m\angle Q$



4. BC



$$7^2 + 4^2 = x^2$$

$$49 + 16 = x^2$$

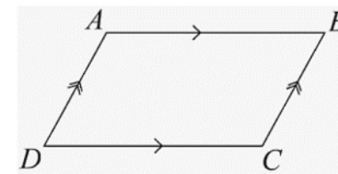
$$x^2 = 65$$

$$x = 8.06 \text{ } 8.1$$

Fill in the essential question for this section: What are the relationships of the sides the LS, and the diagonals of a parallelogram?

DEFINITION

A parallelogram is a quad. (4 sides) w 2 pairs of // sides



**EXAMPLE 4** **Try It!** Use Angles of a Parallelogram

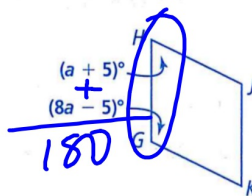
4. Use the parallelogram shown.

a. Given parallelogram  $GHJK$ , what is the value of  $a$ ?

$$a = 20$$

$$155^\circ \quad 25^\circ \quad 135^\circ \quad 25^\circ$$

b. What are  $m\angle G$ ,  $m\angle H$ ,  $m\angle J$ , and  $m\angle K$ ?



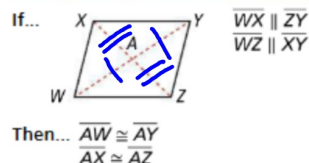
**HABITS OF MIND**

**Reason** Under what conditions can a pair of consecutive angles in a parallelogram be congruent? Explain. © MP.2

When the fig. is a square/rectangle making the angles rt  $\angle$ s.

**Theorem 6-10:**

If a quadrilateral is a parallelogram, then its diagonals bisect each other

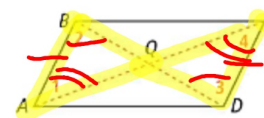


A proof of theorem 6-10 follows.

**Example 5:**  $\overline{AC}$  and  $\overline{BD}$  are the diagonals of parallelogram,  $ABCD$ .

**Given:**  $ABCD$  is a parallelogram.

**Prove:**  $\overline{AQ} \cong \overline{CQ}$ ,  $\overline{BQ} \cong \overline{DQ}$



11-gram Thm

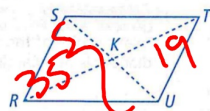
Statements	Reasons
1. $ABCD$ is a parallelogram	1. Given
2. $\overline{AB} \cong \overline{DC}$	2. opp sides in a parallelogram are $\cong$
3. $\overline{AB} \parallel \overline{DC}$	3. Def of 11-gram
4. $\angle 1 \cong \angle 4$ and $\angle 2 \cong \angle 3$	4. alt int angles
5. $\triangle ABQ \cong \triangle CDQ$	5. ASA
6. $\overline{AQ} \cong \overline{CQ}$ and $\overline{BQ} \cong \overline{DQ}$	6. CPCTC

**EXAMPLE 5** **Try It!** Explore the Diagonals of a Parallelogram

5. Use parallelogram  $RSTU$  with  $SU = 35$  and  $KT = 19$ .

a. What is  $SK$ ?

$$17.5$$



b. What is  $RT$ ?

$$38$$

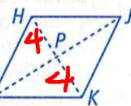
**EXAMPLE 6** **Try It!** Find Unknown Lengths in a Parallelogram

6. Given parallelogram  $GHJK$  with  $PK = 4$  and  $HK = \frac{2}{3}(GJ)$ , what is  $GP$ ?

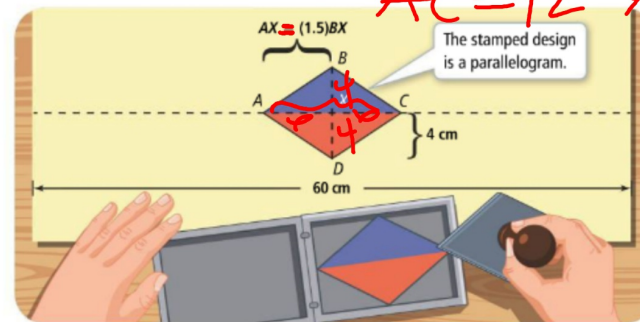
$$\frac{3}{2} \cdot 8 = \frac{2}{3}(GJ) \cdot \frac{3}{2}$$

$$GJ = 12$$

$$GP = 4$$



**Example 6:** Corey Stamps the pattern shown on the front of a poster she is making. How many times will she need to stamp the design to make a row 60cm wide along the dashed line?



$$AC = 12$$

$$AX = 1.5 \cdot 4$$

$$= 6$$

$$AC = 12$$

$$60 \div 12$$

$$5 \text{ times}$$

**HABITS OF MIND**

**Look for Relationships** How can you tell which diagonal of a parallelogram has the greater length? **MP.7**

The longer diagonal connects the vertices w/ the smaller angles.

**In your book:** Read Concept Summary and #1-12, page 268 (page 146 in student companion).

Tomorrow's HW: page 269 #14, 16-21, 24, 26-28

**skip 17 and 26**