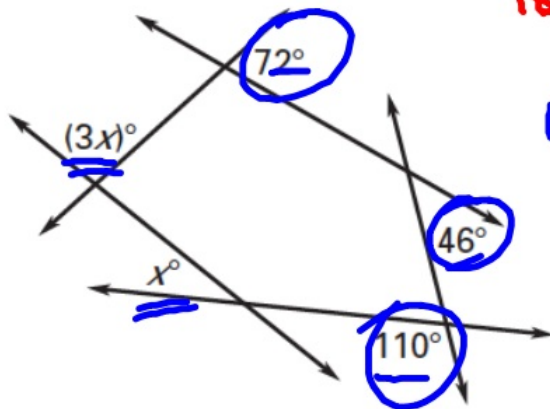


1. Find the sum of the measures of the interior angles of a convex 24-gon. $(24-2)180 = 22 \cdot 180 = \boxed{3960^\circ}$

2. The sum of the measures of the interior angles of a convex polygon is 5040° . Classify the polygon by the number of sides.

3. Find the value of x . $\frac{5040}{180} = 28 + 2 = 30$
 $\boxed{30\text{-gon}}$



$$4x + 228 = 360$$
$$\underline{-228 \quad -228}$$
$$4x = 132$$
$$\frac{4x}{4} = \frac{132}{4} \quad \boxed{x = 33}$$

4. Find the measure of an interior angle and an exterior angle of a regular 36-gon.

int \angle

$$(36-2)180$$
$$34 \cdot 180$$
$$6120$$
$$\div 36 \quad \boxed{170^\circ}$$

ext \angle

$$360 \div 36$$
$$\boxed{10^\circ}$$


8.2 Use Properties of Parallelograms

Goal • Find angle and side measures in parallelograms.

PARALLELOGRAM

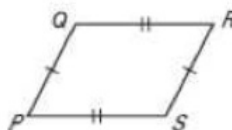
a quadrilateral whose opposite sides are parallel



IF A QUADRILATERAL IS A  THEN.....

Theorem 8.3

Both pairs of opposite sides are \cong .



If PQRS is a parallelogram, then $\overline{QP} \cong \overline{RS}$ and $\overline{QR} \cong \overline{PS}$

Theorem 8.4

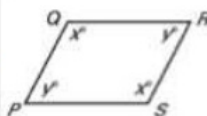
Both pairs of opposite \angle 's are \cong .



If PQRS is a parallelogram, then $\angle P \cong \angle R$ and $\angle Q \cong \angle S$.

Theorem 8.6

It's consecutive angles are supplementary

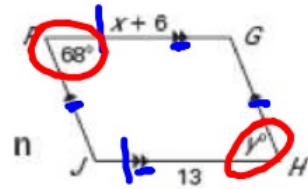


If PQRS is a parallelogram, then $x^\circ + y^\circ = 180^\circ$.

EXAMPLE 1: Find the value of x and y

$$\begin{array}{r} x + y = 13 \\ \underline{-y \quad -y} \\ \hline x = 7 \end{array}$$

$$y = 68$$

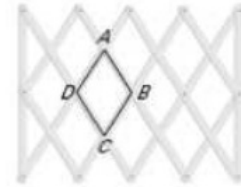
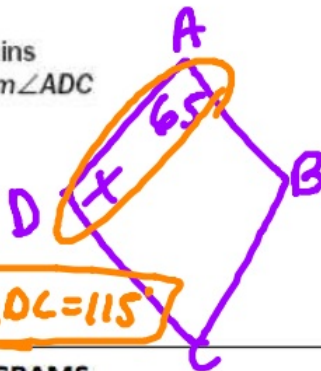


EXAMPLE 2:

Gates As shown, a gate contains several parallelograms. Find $m\angle ADC$ when $m\angle DAB = 65^\circ$.

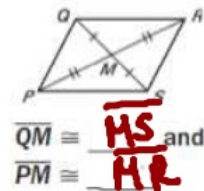
$$\begin{array}{r} x + 65 = 180 \\ \underline{-65 \quad -65} \\ \hline x = 115 \end{array}$$

$$m\angle ADC = 115$$



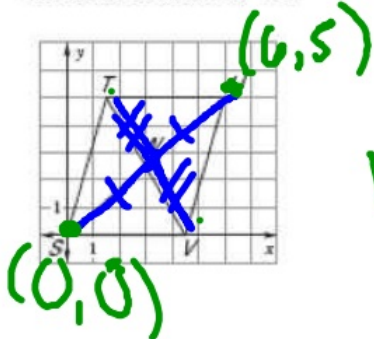
DIAGONALS IN PARALLELOGRAMS

bisect each other



$$\overline{QM} \cong \overline{MS} \text{ and } \overline{PM} \cong \overline{MR}$$

The diagonals of $\square STUV$ intersect at point W. Find the coordinates of W.

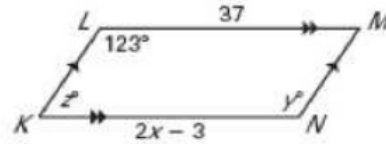


$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$W = \left(\frac{0+6}{2}, \frac{0+5}{2} \right)$$

$$= (3, 2\frac{1}{2})$$

- ✔ **Checkpoint** Find the indicated measure in $\square KLMN$ shown at the right.



1. x

$$\begin{aligned} 2x - 3 &= 37 \\ +3 &+3 \\ \hline 2x &= 40 \\ \div 2 &\div 2 \\ \hline x &= 20 \end{aligned}$$

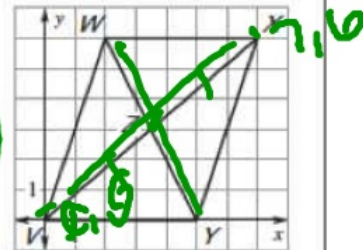
2. $y = 123^\circ$

3. z

$$\begin{array}{r} 180 \\ - 123 \\ \hline z = 57 \end{array}$$

4. The diagonals of $\square VWXY$ intersect at point Z . Find the coordinates of Z .

$$Z = \left(\frac{0+7}{2}, \frac{0+6}{2} \right) = \left(3\frac{1}{2}, 3 \right)$$



5. Given that $\square FGHI$ is a parallelogram, find MH and FH .

$$\begin{aligned} MH &= 5 \\ FH &= 10 \end{aligned}$$

