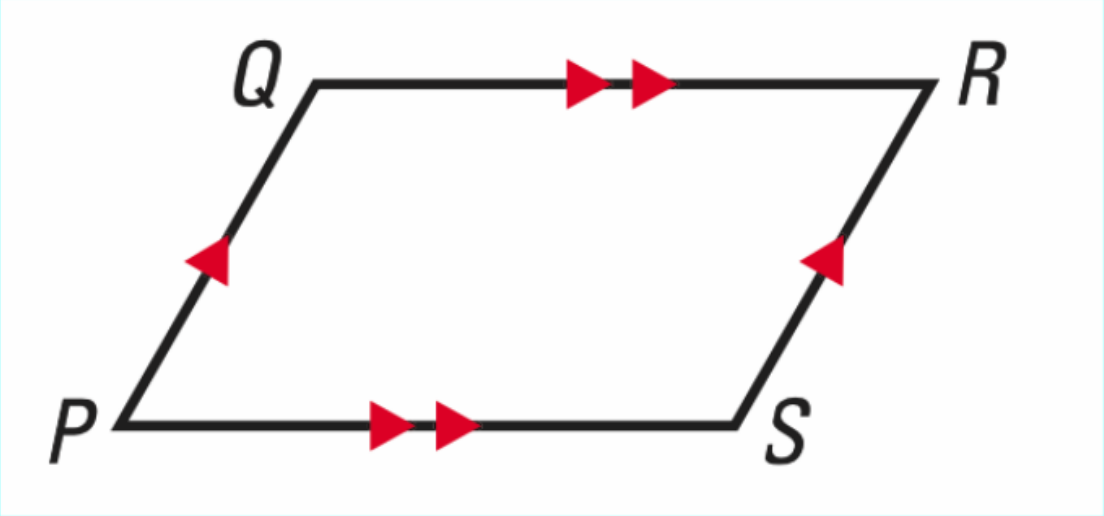
8.2 Use Properties of Parallelograms

parallelogram-Quadrilateral where both pairs of opposite sides are parallel

We will look at other characteristics about parallelograms.



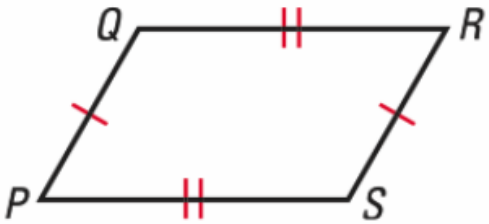
THEOREMS

For Your Notebook

THEOREM 8.3

If a quadrilateral is a parallelogram, then its opposite sides are congruent.

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



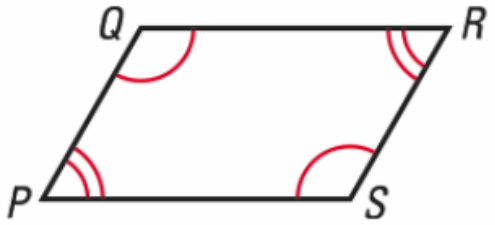
Proof: p. 516

THEOREM 8.4

If a quadrilateral is a parallelogram, then its opposite angles are congruent.

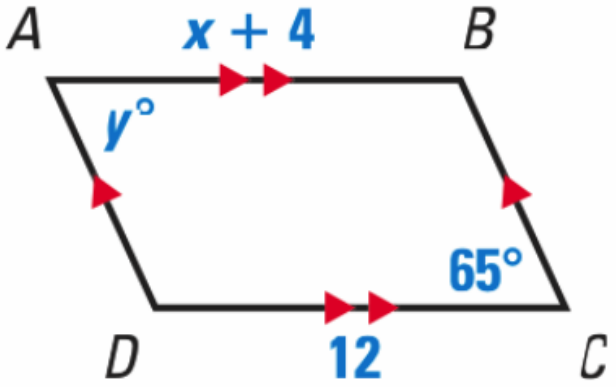
If $PQRS$ is a parallelogram, then $\angle P \cong \angle R$ and $\angle Q \cong \angle S$.

Proof: Ex. 42, p. 520

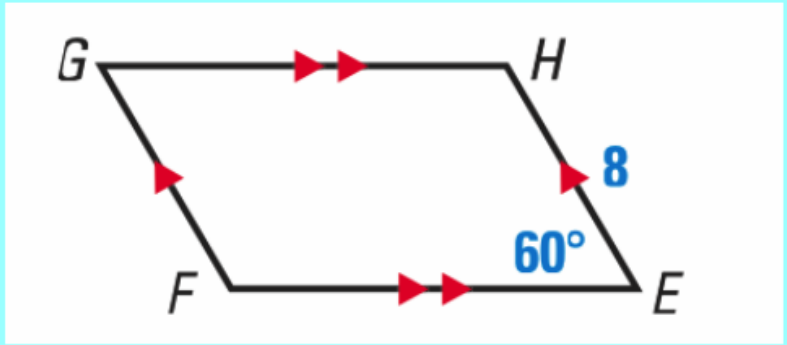


EXAMPLE 1 Use properties of parallelograms

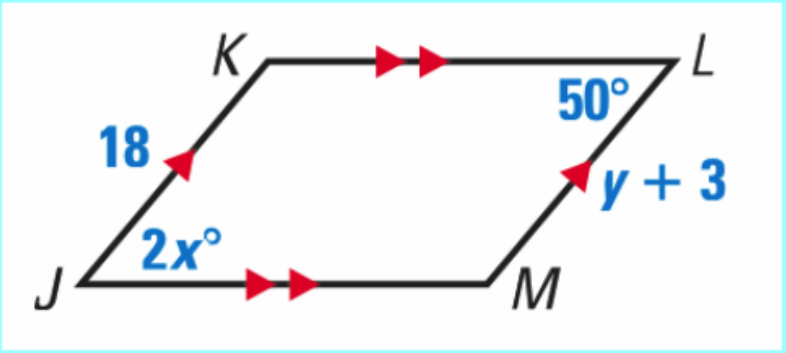
ALGEBRA Find the values of x and y.



Find FG and $m\angle G$.

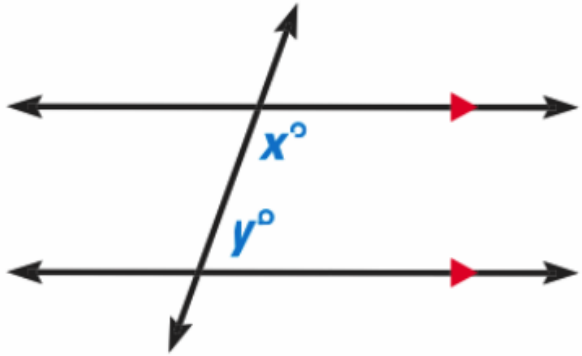


Find the values of x and y.



INTERIOR ANGLES The Consecutive Interior Angles Theorem (page 155) states that if two parallel lines are cut by a transversal, then the pairs of consecutive interior angles formed are supplementary.

A pair of consecutive angles in a parallelogram are like a pair of consecutive interior angles between parallel lines. This similarity suggests Theorem 8.5.



$x° + y° = 180°$

THEOREM

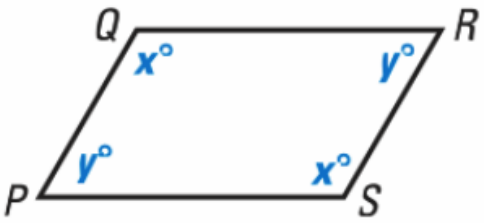
For Your Notebook

THEOREM 8.5

If a quadrilateral is a parallelogram, then its consecutive angles are supplementary.

If $PQRS$ is a parallelogram, then $x° + y° = 180°$.

Proof: Ex. 43, p. 520



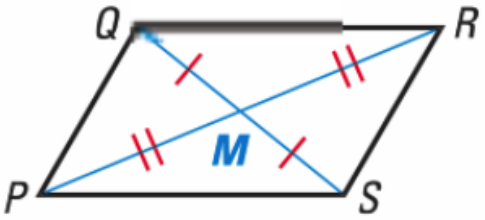
THEOREM

For Your Notebook

THEOREM 8.6

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

Proof: Ex. 44, p. 521

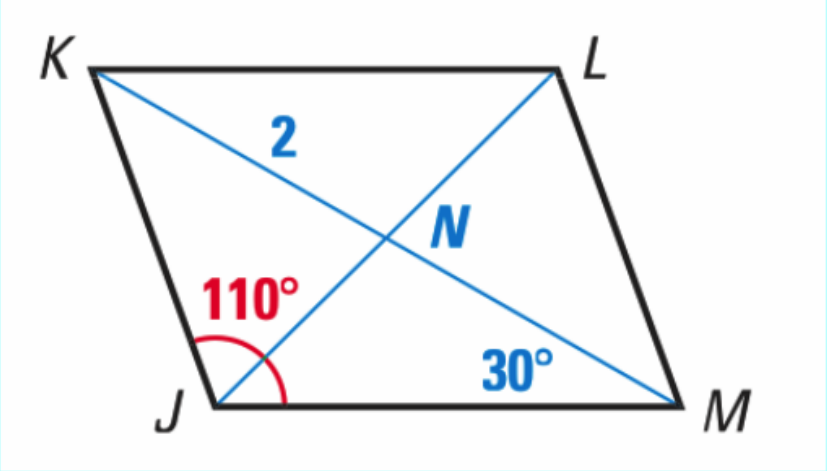


$\overline{QM} \cong \overline{SM}$ and $\overline{PM} \cong \overline{RM}$

Find the indicated measure in $\square JKLM$.

NM

KM



$m\angle JML$

$m\angle KML$

Assignment:

p. 518 (3-11, 13, 14, 17-28)