6-3 Proving a Quadrilateral is a Parallelogram

Thm 6-5: If both pairs of opposite sides of a quad. are congruent, then the quadrilateral is a parallelogram.

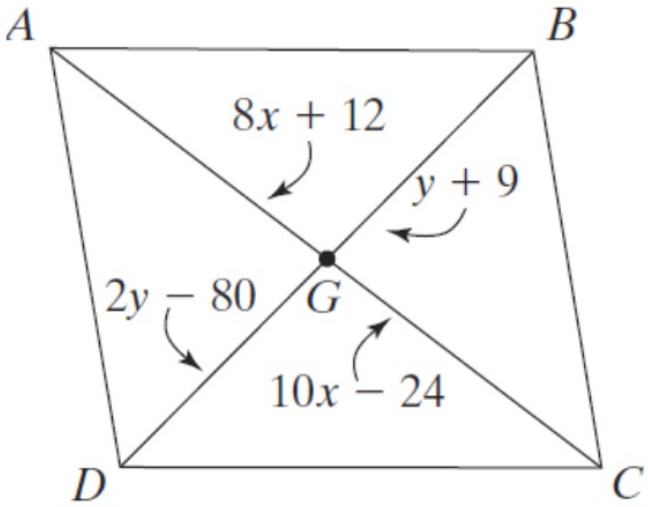
Thm 6-6: If both pairs of opposite angles of a quad. are congruent, then the quad. is a parallelogram.

Thm 6-7: If the diagonals of a quad. bisect each other, then the quad. is a parallelogram.

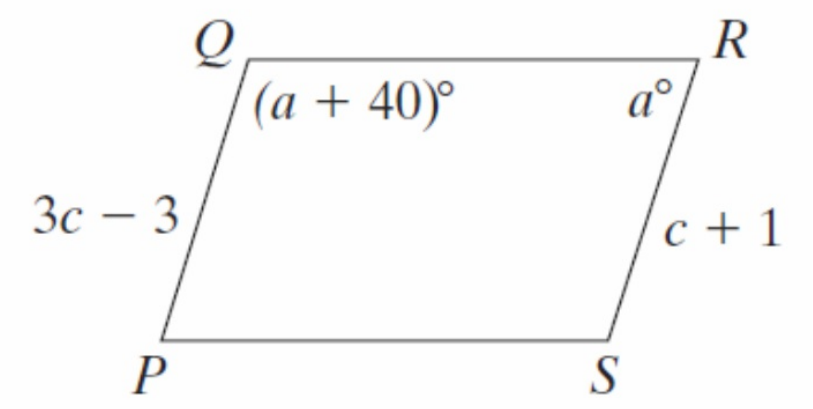
Thm 6-8: If one pair of opposite sides of a quad is both congruent and parallel, then the quad. is a parallelogram.

Examples

1 Finding Values for Parallelograms Find values for x and y for which $ABCD$ must be a parallelogram.



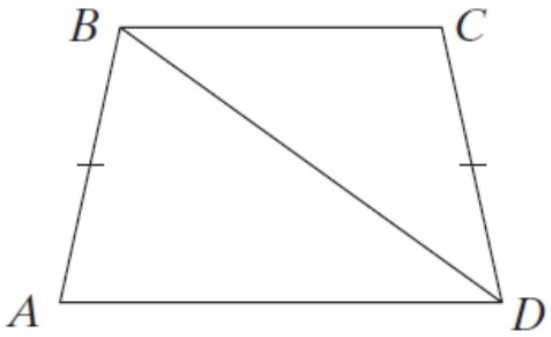
Find the values of a and c for which $PQRS$ must be a parallelogram.



Is the Quadrilateral a Parallelogram? Can you prove the quadrilateral is a parallelogram from what is given? Explain.

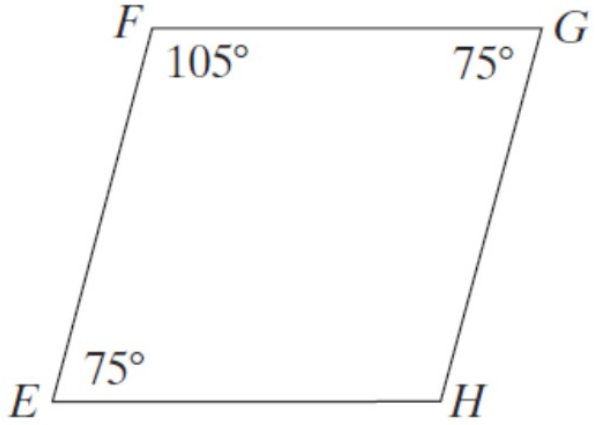
a. Given: $\overline{AB} \cong \overline{CD}$

Prove: $ABCD$ is a parallelogram.



b. Given: $m\angle E = m\angle G = 75°, m\angle F = 105°$

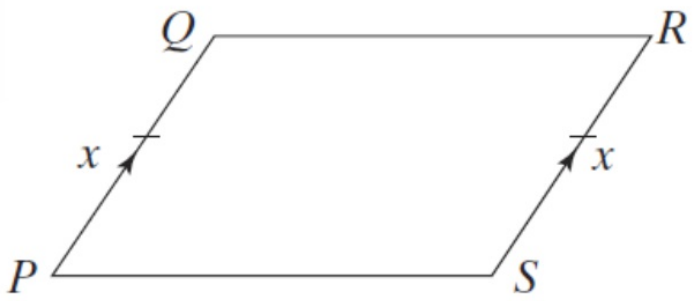
Prove: $EFGH$ is a parallelogram.



Can you prove the quadrilateral is a parallelogram? Explain.

a. **Given:** $\overline{PQ} \cong \overline{SR}, \overline{PQ} \parallel \overline{SR}$

Prove: $PQRS$ is a parallelogram.



b. **Given:** $\overline{DH} \cong \overline{GH}, \overline{EH} \cong \overline{FH}$

Prove: $DEFG$ is a parallelogram.