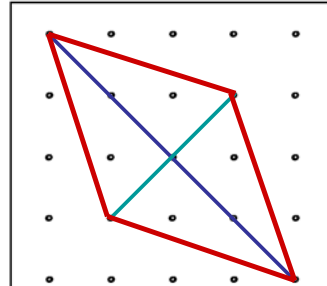


Lesson 6.3

Proving that a Quadrilateral is a Parallelogram

By definition, a parallelogram has both pairs of opposite sides parallel.

On your dot paper, draw two segments that bisect each other.

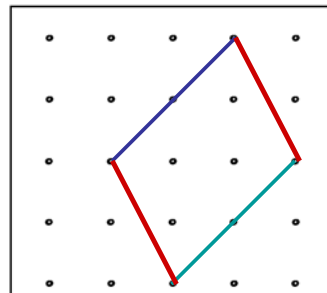


Then connect the endpoints to form a quadrilateral. Find the slopes of the opposite pairs of sides and determine the type of quadrilateral.

Compare your results with those of the students around you.

What conjecture would you make about quadrilaterals whose diagonals bisect each other?

On your dot paper, draw a pair of parallel lines that are also congruent.



Connect the endpoints to form a quadrilateral. Find the slopes and determine what type of quadrilateral it is.

Compare your results with those of the students around you.

What conjecture can you make about quadrilaterals that have one pair of congruent and parallel sides.

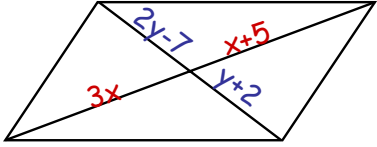
Theorem 6.5:

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

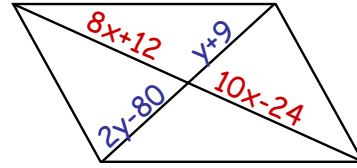
Theorem 6.6:

If one pair of opposite sides of a quadrilateral is both congruent and parallel, then the quadrilateral is a parallelogram.

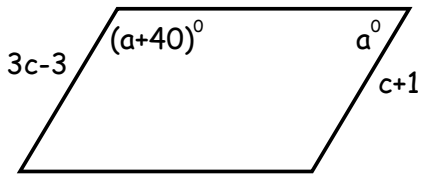
Find x and y for which this figure must be a parallelogram.



Find the values of x and y so that the figure must be a parallelogram.

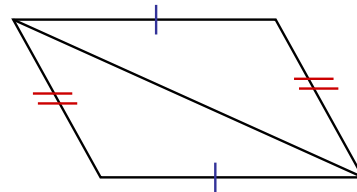


Find the values of a and c for which the figure must be a parallelogram.



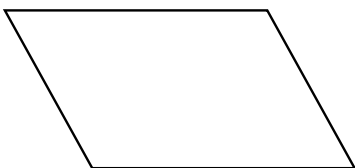
Theorem 6.7:

If both pairs of opposite sides of a quadrilateral are congruent, then the quadrilateral is a parallelogram.

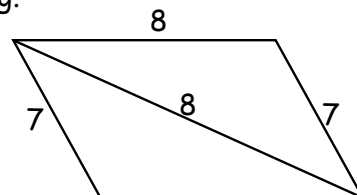


Theorem 6.8:

If both pairs of opposite angles of a quadrilateral are congruent, then the quadrilateral is a parallelogram.

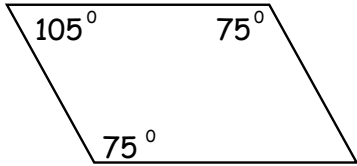


Determine whether each quadrilateral must be a parallelogram. Explain your reasoning.



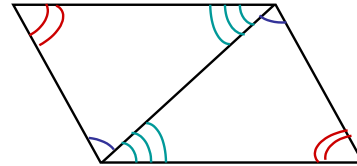
No, you don't know whether both pairs of opposite sides are congruent.

Determine whether each quadrilateral must be a parallelogram. Explain your reasoning.



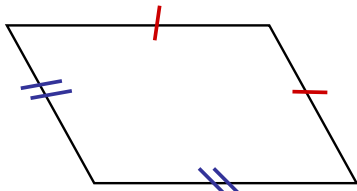
Yes, both pairs of opposite angles are congruent.

Determine whether each quadrilateral must be a parallelogram. Explain your reasoning.



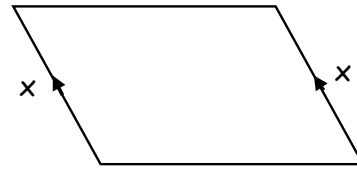
Yes, both pairs of opposite angles are congruent.

Determine whether each quadrilateral must be a parallelogram. Explain your reasoning.



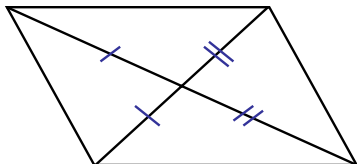
No, the figure could be a kite.

Determine whether each quadrilateral must be a parallelogram. Explain your reasoning.



Yes, one pair of sides is both parallel and congruent.

Determine whether each quadrilateral must be a parallelogram. Explain your reasoning.



No, the figure could be a trapezoid.