

**Honors Geometry  
Coordinate Proofs****Proving a Quadrilateral is a Parallelogram in the Coordinate Plane****Proving a Quadrilateral is a Parallelogram (need to show one of the below is true)**

1. Both pairs of opposite sides are parallel
2. Both pairs of opposite sides are congruent
3. One pair of opposite sides are both parallel and congruent
4. Diagonals bisect each other

**The vertices of quadrilateral ABCD are given. Draw ABCD on the coordinate plane. Then prove that it is a parallelogram by the method indicated.**

1.  $A(-3, 2)$ ,  $B(1, 2)$ ,  $C(0, -1)$ ,  $D(4, -1)$ ; Using: 1 pair of opposite sides are congruent & parallel
2.  $A(-1, 4)$ ,  $B(3, 2)$ ,  $C(3, -4)$ ,  $D(-1, -2)$ ; Using: both pairs of opposite sides are congruent
3.  $A(-2, -3)$ ,  $B(0, 5)$ ,  $C(6, 5)$ ,  $D(4, -3)$ ; Using: both pairs of opposite sides are parallel
4.  $A(-3, -4)$ ,  $B(-1, 2)$ ,  $C(7, 0)$ ,  $D(5, -6)$ ; Using: diagonals bisect each other

---

**Proving a Quadrilateral is a Rectangle in the Coordinate Plane****Proving a Quadrilateral is a Rectangle (need to show one of the below is true)**

1. All angles are right angles
2. Show it is a parallelogram first. Then show the diagonals are congruent.
3. Show it is a parallelogram first. Then show one angle is a right angle.

**Let's try a couple!**

1. Show quadrilateral PQRS with vertices P (1, 7), Q (5, 9), R (8, 3), and S (4, 1) is a rectangle.
2. Show quadrilateral ABCD with vertices A (3, 0), B (1, 3), C (-5, -1), and D (-3, -4) is a rectangle.

**Homework:**

1. Show quadrilateral ABCD with vertices A (4, 3), B (4, -2), C (-4, -2), and D (-4, 3) is a rectangle.
2. Show quadrilateral WXYZ with vertices W (-2, 4), X (5, 5), Y (6, -2), and Z (-1, -3) is a rectangle.
3. Show quadrilateral QRST with vertices Q (-2, 2), R (0, -2), S (6, 1), and T (4, 5) is a rectangle.