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10.4 Coordinate Proof Using Distance with Quadrilaterals

Things to remember:

Parallel lines have the same slope

Perpendicular lines have opposite reciprocal slopes
(product is -1)

Opposite sides of a parallelogram are congruent

Diagonals of a parallelogram bisect each other (or have the
same midpoint)

Diagonals of a rectangle are congruent

Diagonals of a rhombus are perpendicular

If a quadrilateral is both a rhombus and a rectangle, then it is
also a square

How to prove a quadrilateral is a parallelogram

- Show that opposite sides are parallel
(use slope formula)
- Show that opposite sides are congruent
(use distance formula or Pythagorean Thm)
- Show that diagonals bisect each other
(use midpoint formula)

How to prove a parallelogram is a rhombus

- Show that consecutive sides are congruent (use distance formula or Pythagorean Thm)
- Show that diagonals are perpendicular (use slope formula to show opposite reciprocals)

How to prove a parallelogram is a rectangle

- Show that diagonals are congruent
(use distance formula or Pythagorean Thm)
- Show that consecutive sides are perpendicular
(use slope formula to show opposite reciprocals)

How to prove a parallelogram is a square

Show that it is both a rhombus and a rectangle

How to prove a quadrilateral is a trapezoid

- Show that it has exactly one pair of parallel sides (use slope formula)

How to prove a trapezoid is isosceles

- Show that legs (non parallel sides) are congruent (use distance formula or Pythagorean Thm)
- Show that diagonals are congruent (use distance formula or Pythagorean Thm)

How to prove a quadrilateral is a kite

- Show that both pairs of consecutive sides are congruent and distinct
(use distance formula or Pythagorean Thm)