

Quadrilateral Flowchart

Quadrilateral

- Interior angles add up to 360°
- Four sided polygon

Parallelogram

- Both pairs of opposite sides are parallel
- Both pairs of opposite sides are congruent
- Both pairs of opposite angles are congruent
- Consecutive angles are supplementary
- Diagonals bisect each other

Rhombus

- 4 congruent sides
- Diagonals are perpendicular bisectors
- Diagonals bisect opposite angles

Rectangle

- 4 right angles
- Diagonals are congruent

Square

- 4 congruent sides
- 4 right angles

Trapezoid

- Exactly 1 pair of parallel sides (bases)
- Angles on the same side of a leg are supplementary

Isosceles Trapezoid

- Legs are congruent
- Base angles congruent
- Diagonals are congruent
- Consecutive leg angles are supplementary

Kite

- Two pairs of adjacent sides are congruent

Objective: Determine the type of quadrilateral given four coordinates.

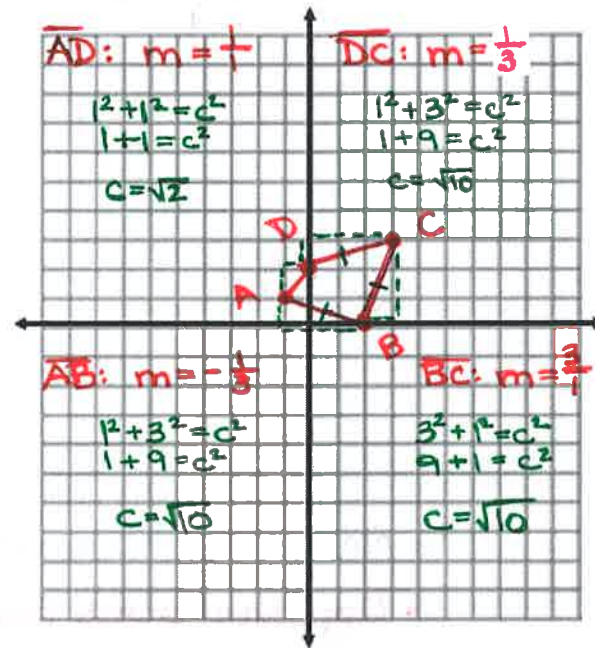
Warm Up: Fill in the missing information on the Quadrilateral Flowchart to the best of your knowledge.

Example 1:

Determine the most descriptive name for quadrilateral ABCD with vertices at the coordinates $A(-1, 1)$, $B(2, 0)$, $C(3, 3)$, and $D(0, 2)$. Write a concise explanation for your reasoning using mathematical evidence to support your statement.

- Slopes are all different so none of the sides are parallel
 ↳ not a parallelogram, rhombus, rectangle, square, or trapezoid
- Both sets of adjacent sides are not congruent
 ↳ not a kite

It's a Quadrilateral



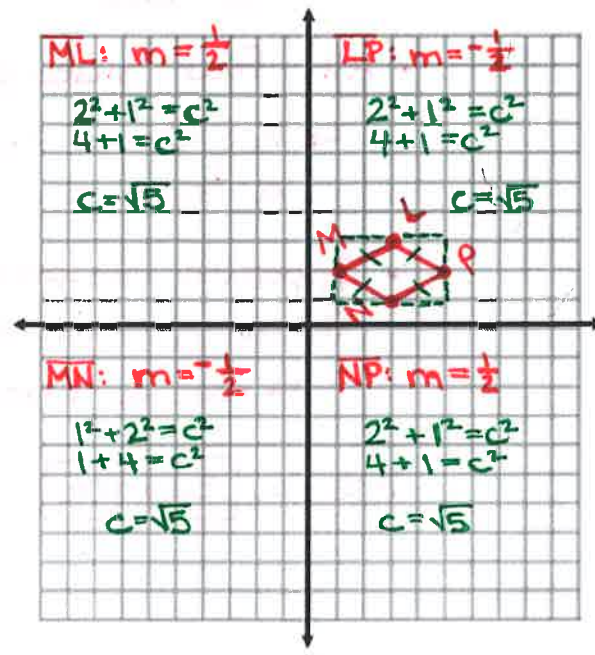
Example 2:

Determine the most descriptive name for the quadrilateral with vertices at each set of coordinates below.

a. $L(3, 3)$, $M(1, 2)$, $N(3, 1)$, and $P(5, 2)$

- Opposite sides have the same slope so they're parallel
 ↳ not a quadrilateral or trapezoid
- All four sides are congruent
 ↳ it's either a rhombus or a square
- No opposite reciprocal slopes so there's no right angles
 ↳ not a square

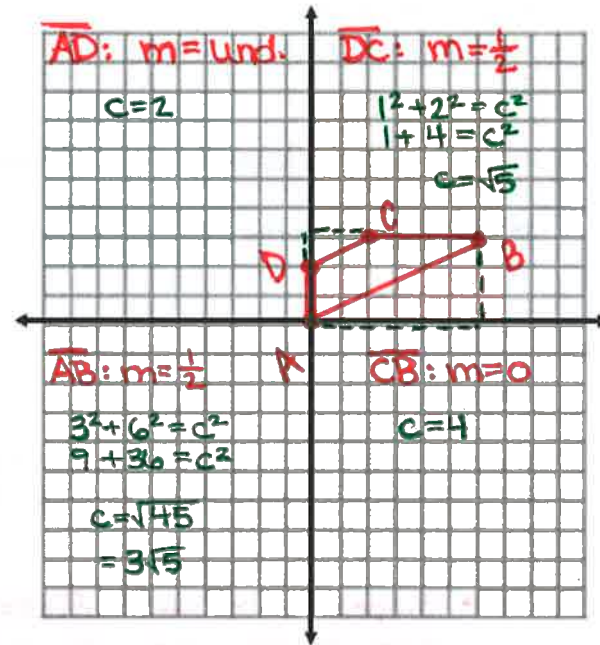
It's a rhombus



b. $A(0,0), B(6,3), C(2,3),$ and $D(0,2)$

- Only two sides have the same slope / are parallel

It's a trapezoid



c. $R(0,4), S(-1,1), T(2,0),$ and $U(3,3)$

- Opposite sides have the same slope / are parallel

↳ not a quadrilateral, trapezoid or kite

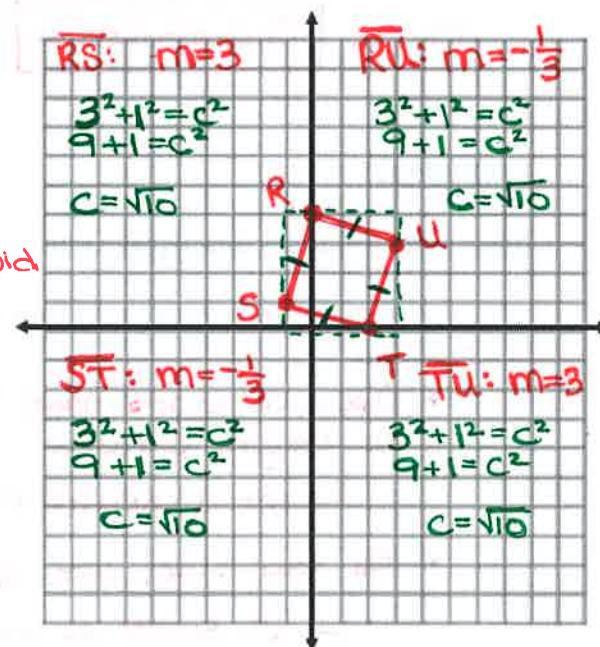
- All four sides are congruent

↳ it's either a rhombus or a square

- Opposite reciprocal slopes forming right angles

↳ not a rhombus

It's a square



d. $K(1,4), J(3,6), L(3,1),$ and $M(5,4)$

• Adjacent sides are congruent

It's a kite

