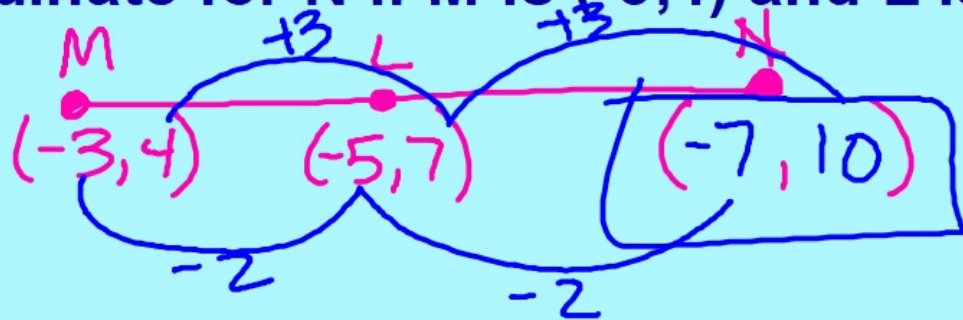
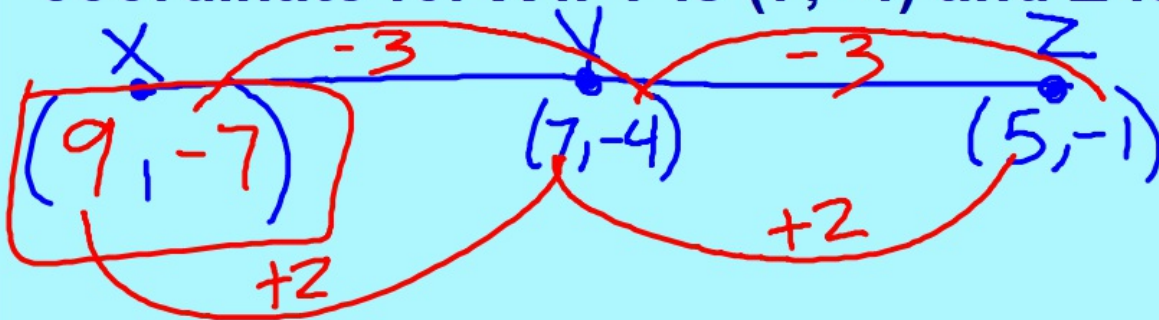


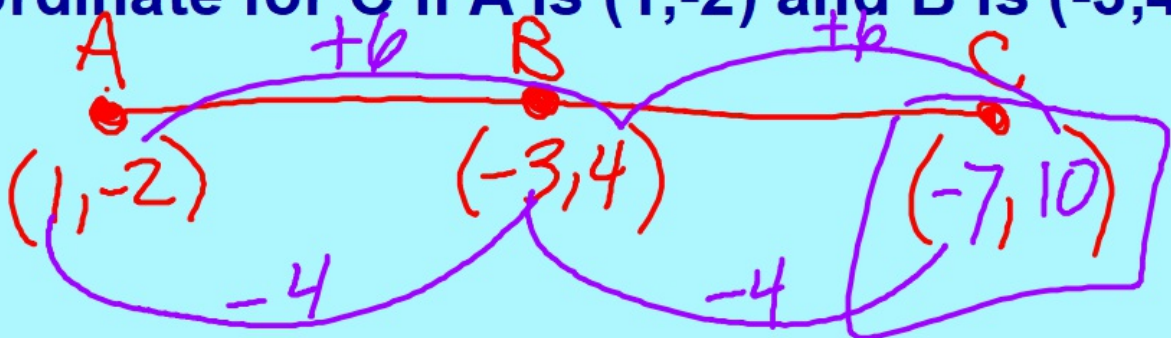
1. Point L is the midpoint of MN. Find the coordinate for N if M is $(-3, 4)$ and L is $(-5, 7)$



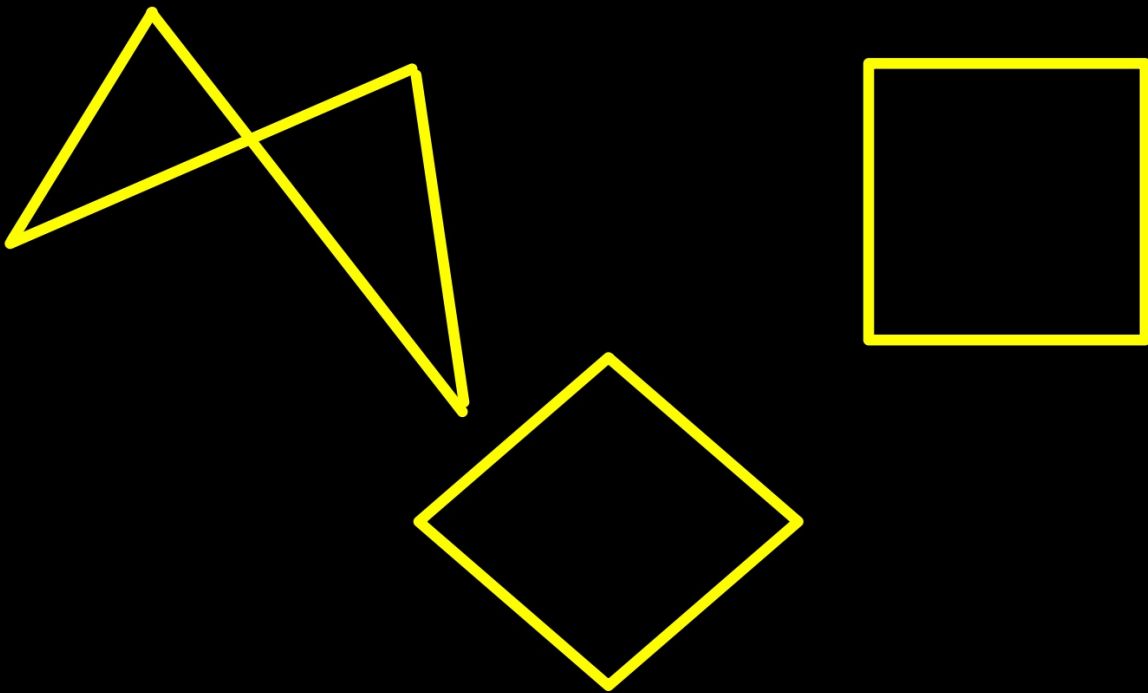
2. Point Y is the midpoint of XZ. Find the coordinate for X if Y is $(7, -4)$ and Z is $(5, -1)$



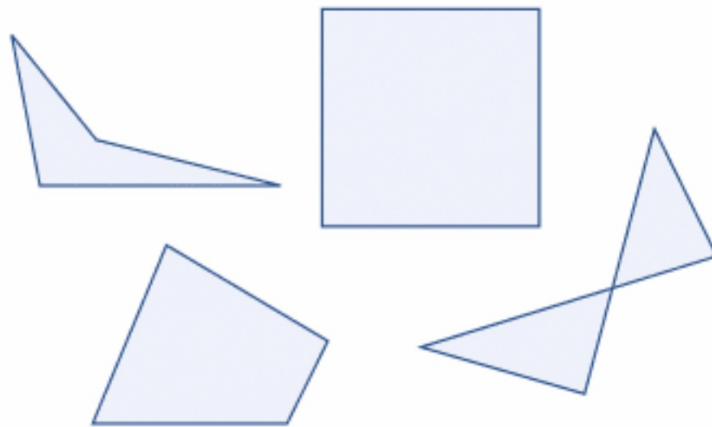
3. Point B is the midpoint of AC. Find the coordinate for C if A is $(1, -2)$ and B is $(-3, 4)$



Quadrilaterals



Quadrilateral just means "four sides"
(*quad* means four, *lateral* means side).

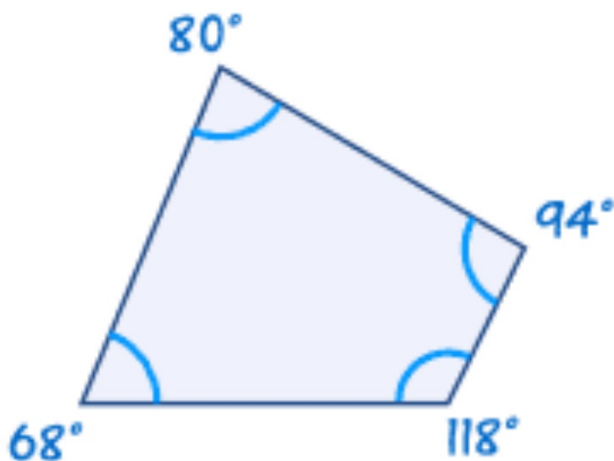


Any four-sided shape is a Quadrilateral.

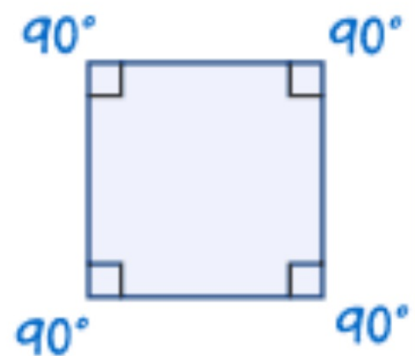
But the sides have to be **straight**, and it has to be **2-dimensional**.

Properties of Quadrilaterals:

- Four sides (edges)
- Four vertices (corners)
- The interior angles add up to **360 degrees**:



$$68^\circ + 118^\circ + 94^\circ + 80^\circ = 360^\circ$$

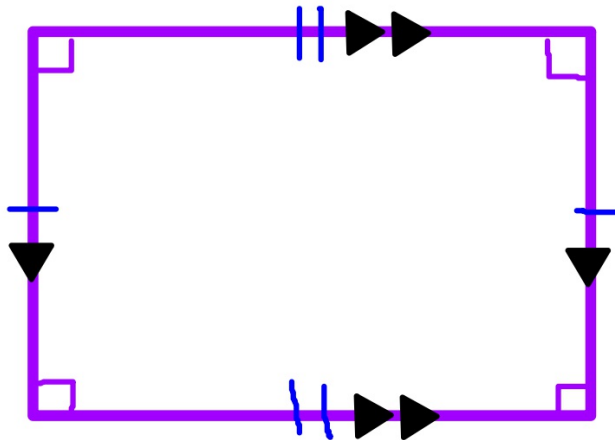


$$4 \times 90^\circ = 360^\circ$$

Types of Quadrilaterals

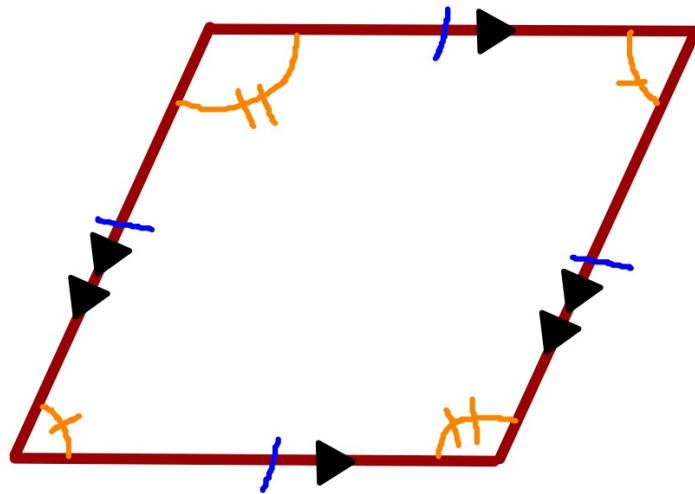
RECTANGLES

- A rectangle is a four-sided shape where every angle is a right angle (90°).
- **Opposite sides** are parallel and of equal length.

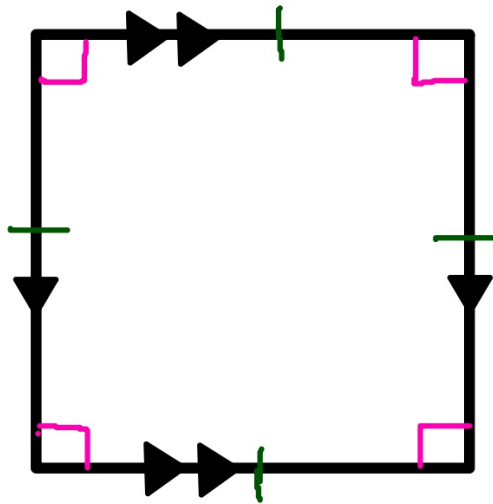


RHOMBUS

- A **rhombus** is a four-sided shape where all sides have equal length.
- opposite sides are parallel *and* opposite angles are equal.

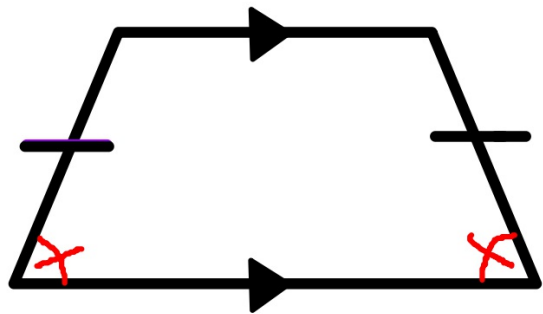
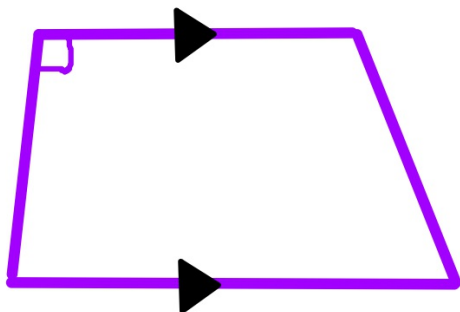


SQUARES



- A square has equal sides and every angle is a right angle (90°)
- opposite sides are parallel.
- A square also fits the definition of a **rectangle** (all angles are 90°), and a **rhombus** (all sides are equal length).

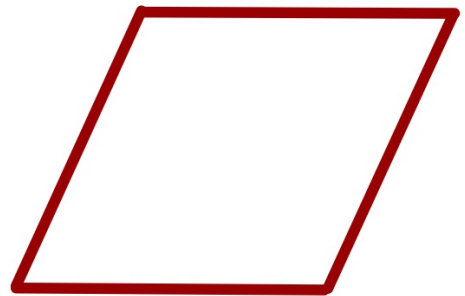
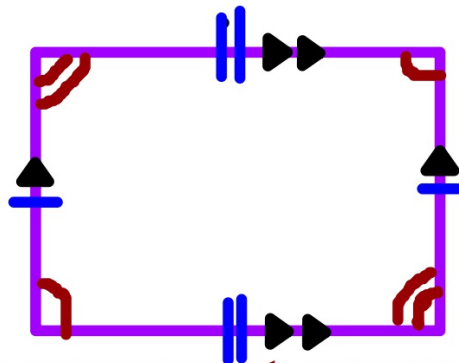
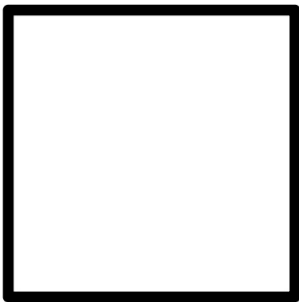
TRAPEZOIDS



- A trapezoid has one pair of opposite sides that are parallel.
- Isosceles trapezoid: Sides that aren't parallel are equal in length and both angles coming from a parallel side are equal, as shown.

PARALLELOGRAMS

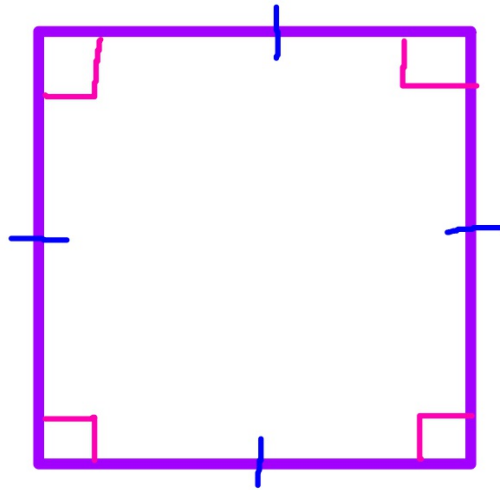
- A parallelogram has opposite sides parallel and equal in length. Also opposite angles are equal
- **NOTE: Squares, Rectangles and Rhombuses are all Parallelograms!**



- **curves represent congruent angles
- **arrows represent parallel sides
- **lines represent equal sides

Example #1

Which correctly names the figure below?

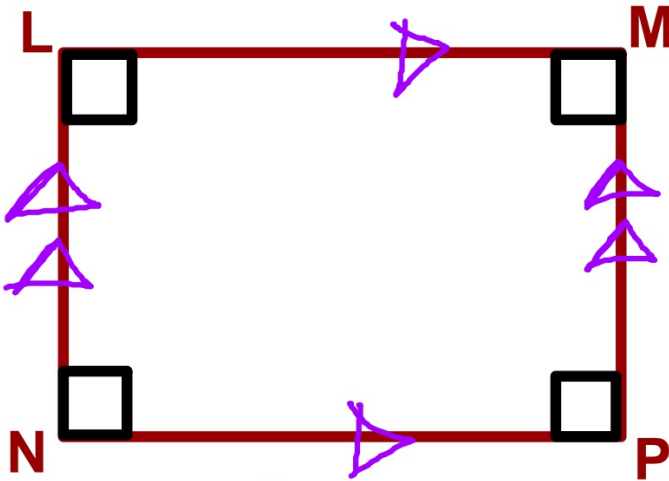


4 \cong Sides
4 \perp angles
opp. sides \parallel

- A. Rectangle
- B. Parallelogram
- C. Square
- D. None of the above

Example #2

Which of the following name(s) correctly identify the figure below:



Given:

$LM \parallel NP$

$LN \parallel MP$

(\parallel =parallel)

A. Quadrilateral

~~C. Rectangle~~

~~E. Trapezoid~~

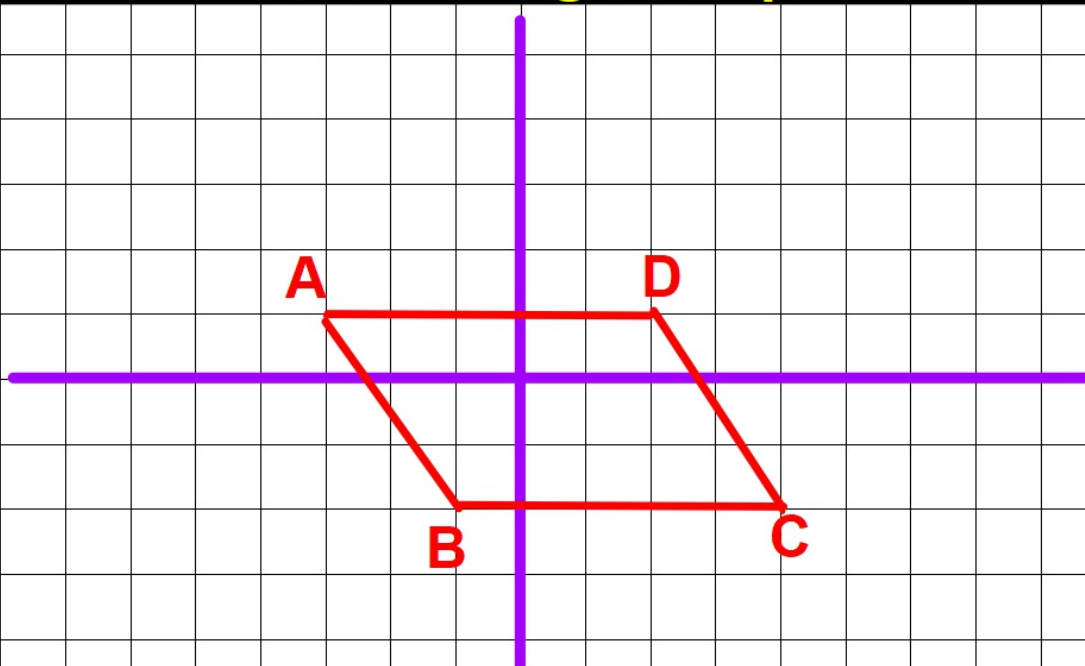
~~B. Parallelogram~~

~~D. Square~~

Example #3

A(-3, 1), B(-1, -2), D(2, 1), and C (4,-2) are the vertices of quadrilateral ABCD.

Could ABCD be a rectangle? Explain



HOW TO PROVE:

\cong sides \rightarrow distance formula
OR
Pythag. Thrm. (GRAPH)

Right angles \rightarrow Perpendicular lines

Parallel sides (opposite recip. slopes)
SAME slope