

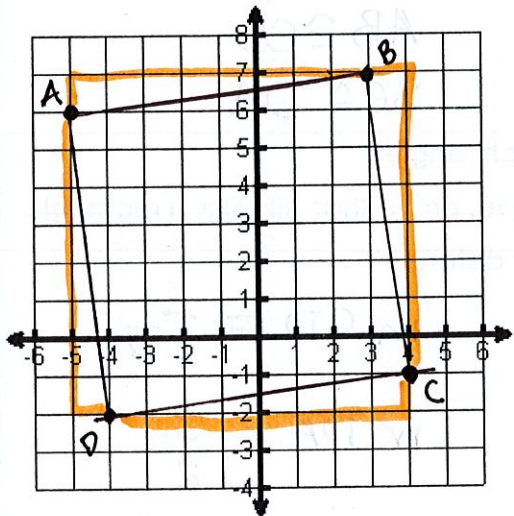
Name: _____ Date: _____

Connecting Algebra & Geometry through Coordinates

Example 1:

Plot and label each point.

A(-5, 6), B(3, 7), C(4, -1), and D(-4, -2)



1a: A square has 4 congruent sides.

Using the definition above, prove that ABCD is a square.

Should you use slope or distance?

$$AB = \sqrt{1^2 + 8^2} = \sqrt{65} = 8.06$$

$$BC = 8.06$$

$$CD = 8.06$$

$$DA = 8.06$$

$$AB \cong BC \cong CD \cong DA$$

1b: A square has 4 right angles.

Using the definition above, prove that ABCD is a square.

Should you use slope or distance?

$$m_{AB} = \frac{1}{8}$$

$$m_{BC} = -8$$

$$m_{CD} = \frac{1}{8}$$

$$m_{DA} = -8$$

$$AB \perp BC$$

$$BC \perp CD$$

Is ABCD a square?

YES

NO

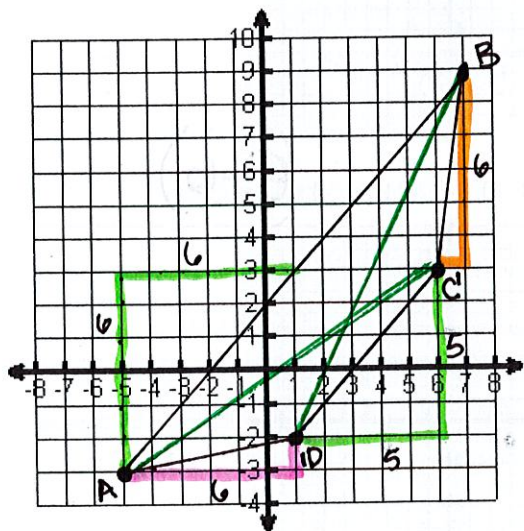
Did you have to prove both parts?

yes, all 4 sides \cong & right angles

Example 2:

Plot and label each point.

A(-5, -3), B(7, 9), C(6, 3), and D(1, -2)



Which quadrilateral(s) does this look like?

trapezoid

Find the slope of each side and both diagonals.

$$\text{Slope of } AB = \frac{1}{6}$$

$$\text{Slope of } DC = \frac{1}{6}$$

$$\text{Slope of } BC = \frac{6}{5}$$

$$\text{Slope of } AD = \frac{1}{6}$$

$$\text{Slope of } AC = \frac{6}{11}$$

$$\text{Slope of } AC = \frac{11}{11}$$

$$\text{Slope of } BD = \frac{11}{6}$$

$$\text{Slope of } BD = \frac{6}{6}$$

What conclusions can you make?

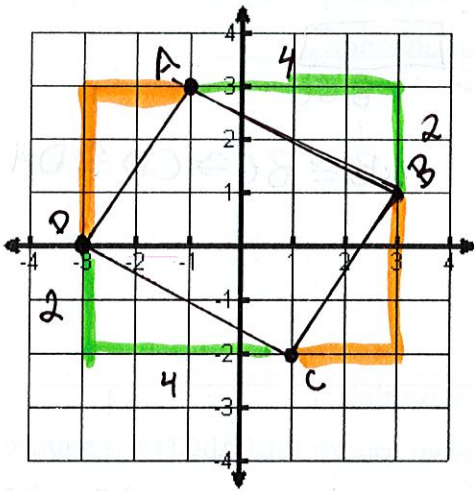
AB // DC ; one pair of parallel sides

Based on your answers above, you have proven this shape to be a(n) trapezoid.

Example 3:

Plot and label each point.

A(-1, 3), B(3, 1), C(1, -2), and D(-3, 0)



3a: A rectangle has opposite sides congruent.

Using the definition above, prove that ABCD is a **rectangle**.

Should you use **slope** or **distance**?

$$AB = 2^2 + 4^2 = c^2 = 4.47$$

$$BC = 2^2 + 3^2 = c^2 = 3.6$$

$$CD = 4.47$$

$$AB \cong CD$$

$$DA = 3.6$$

$$BC \cong DA$$

3b: A rectangle has 4 right angles.

Using the definition above, prove that ABCD is a **rectangle**.

Should you use **slope** or **distance**?

$$m_{AB} = -\frac{1}{2}$$

$$m_{CD} = -\frac{1}{2}$$

$$m_{BC} = \frac{3}{2}$$

$$m_{DA} = \frac{3}{2}$$

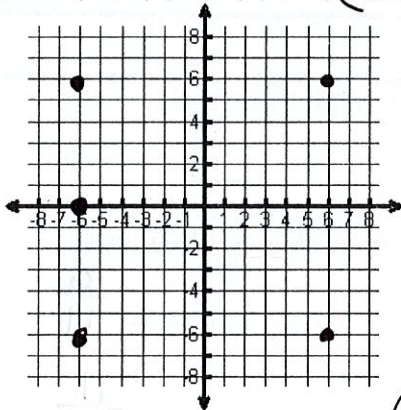
Is ABCD a rectangle?

YES

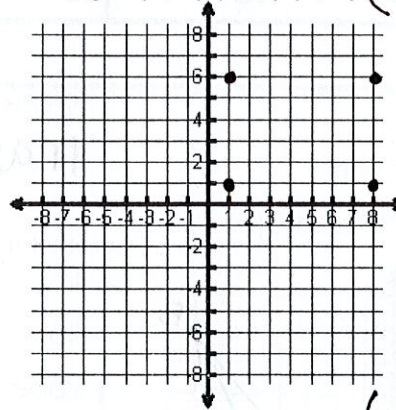
NO

PLOT each set of points on a single graph and find the missing point.

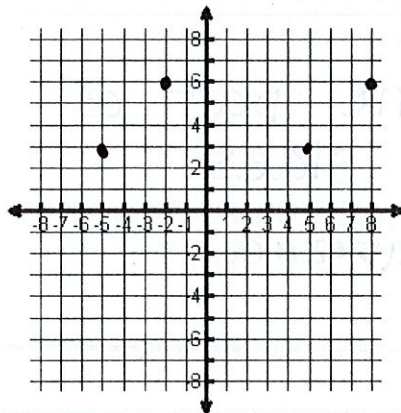
1. Square (-6, 6) (-6, -6) (6, -6) (6, 6)



2. Rectangle (1, 1) (8, 1) (1, 6) (8, 6)



3. Parallelogram (-5, 3) (5, 3) (8, 6) (-2, 6)



4. Rhombus (0, 4) (-3, -1) (3, -1) (0, -6)

