

1. Given  $\triangle LMN$  is located at: L (1, -3), M (1, 3), and N (-2, -3)

a. Find the length of MN  
 $d = \sqrt{(1 - (-2))^2 + (3 - (-3))^2}$   
 $d = \sqrt{(3)^2 + (6)^2}$   
 $d = \sqrt{9 + 36}$

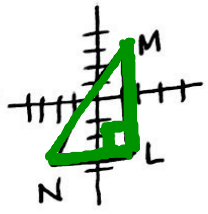
c. Find the slope of MN  
 $\frac{3 - (-3)}{1 - (-2)} = \frac{6}{3} = 2$

$d = \sqrt{45}$   
 $d = 3\sqrt{5}$   
 $d = 6.708$

*Simplify!*

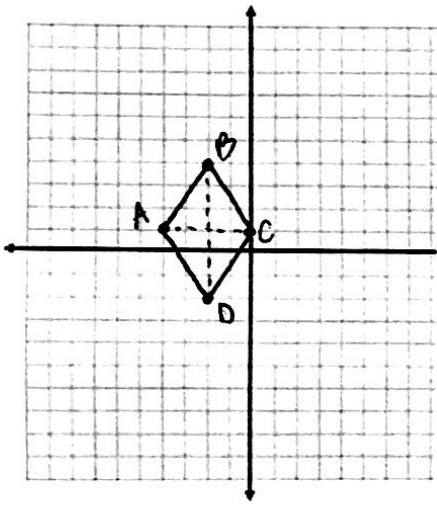
b. Find the midpoint of MN  
 $\left(\frac{1 + (-2)}{2}, \frac{3 + (-3)}{2}\right) = \left(\frac{-1}{2}, \frac{0}{2}\right) = (-0.5, 0)$

d. Find the perimeter and area of  $\triangle LMN$   
 LM = 6  
 MN = 6.708  
 LN = 3  
 Perim: 15.708  
 Area = 9  
 $\frac{b \cdot h}{2}$



2. Given ABCD is located at (-4, 1), (-2, 4), (0, 1), (-2, -2).

a. Sketch quadrilateral ABCD on the coordinate grid below.



*Square rhombus*

side	length	slope
AB	3.61	$\frac{3}{2}$
BC	3.61	$-\frac{3}{2}$
CD	3.61	$\frac{3}{2}$
DA	3.61	$-\frac{3}{2}$

b. Using the given information, what kind of quadrilateral is ABCD?  
 This is a rhombus.

Explain your reasoning using distance and slope information.

All sides congruent. 2 sets of parallel sides, no perpendicular sides.

c. Find the slopes of the diagonals, AC and BD. How are these two segments related? Explain your reasoning.

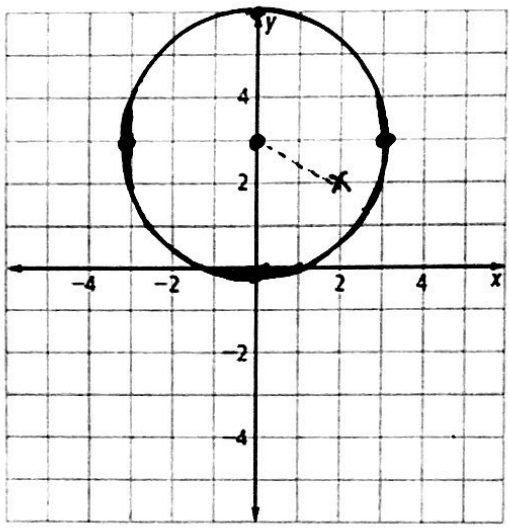
slope of AC  $\frac{0}{0}$   
 slope of BD  $\text{und.}$

*right angle perpendicular opposite reciprocal*

The diagonals are perpendicular. We know because the slopes are opposite reciprocals.

3. Consider the equation  $x^2 + (y - 3)^2 = 9$  which represents the delivery radius for a mail person.

a. Draw a graph of this equation on the coordinate plane.



b. Find the coordinates of three points that will lie on the graph of this equation.

$(3, 3), (0, 6), (-3, 3), (0, 0)$

*\*use points from making circle*

c. If someone lived at the coordinate point (2, 2), would they receive their mail from this mail person? Explain your reasoning.

Yes they would because the distance from the center to their house is less than the radius.

$d = \sqrt{(2 - 0)^2 + (2 - 3)^2}$   
 $= \sqrt{(2)^2 + (-1)^2}$   
 $= \sqrt{4 + 1}$

$d = \sqrt{5}$   
 $d = 2.236 < 3 \checkmark$