

## UNIT 6

## COORDINATE GEOMETRY

DATE	PAGE	TOPIC	HOMEWORK
Jan 2, 2013	2	Solve equations for $y=mx+b$ Write equations given slope and y – intercept. Graph linear equations	Pg 169# 1, 4, 5, 6, 33, 34. *Graph Paper*
1/3	3,4	Find slope given two points Write equation of a line given two points and y-intercept	Parallel Lines in the Coordinate Plane Worksheet #1, 3, 4, 6, 7, 8, 9, 13, 15, 17
1/6	4,5	Equations of lines parallel and perpendicular to each other	Pg 177# 1, 2, 6, 8, 10, 16, 18, 26
1/7	6,7	Write the equations of lines parallel and perpendicular through a given point.	Pg 178# 12, 14, 20, 22
1/8	7	More Equations QUIZ	No HOMEWORK!
1/9	8,9	Find Midpoint and Distance	Distance/Midpoint Worksheet. Circled Questions
1/10	10	Find Perpendicular Bisector	NO HOMEWORK!
1/13	xx	Practice perpendicular bisector	Finish In Class Assignment if not done.
1/14	11	QUIZ Proving things about lines	Pg 351 #12-16 Pg 353 #42-44
1/15	12/13	Proving Types of triangles/Trapezoid	Worksheet HW tri/traps
1/16	14	Proving parallelograms	Worksheet Prove JOHN is a parallelogram
1/17	15	QUIZ Proving Rectangles	Worksheet Prove WARD is a rectangle
1/21	16	Proving Rhombus	Worksheet Prove DROW is a rhombus
1/22	17	Proving Squares	Worksheet Prove ANDY is a square
1/23		REVIEW FOR MIDTERMS	TBD
1/24		REVIEW FOR MIDTERMS	STUDY
2/3	18	Prove a figure is....	No Homework
2/4		Review	TICKET-IN
2/5		TEST	No Homework

### Solve for y/Write equation of a line/Graph

The general equation for a line is  $y = mx + b$  where  
m= \_\_\_\_\_ b= \_\_\_\_\_

Write the equation of a line with the given slope and y-intercept:

1.) Slope:  $\frac{1}{2}$

y-intercept: 4

2.) Slope:  $-\frac{2}{3}$

y-intercept: -1

3.) Slope: 0

y-intercept: 3

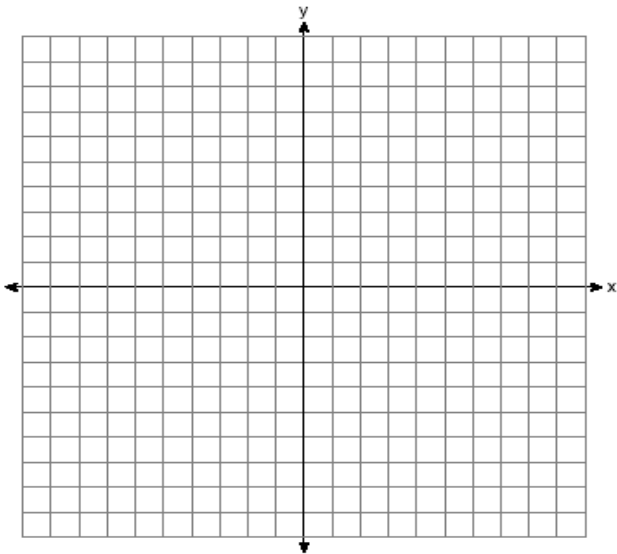
Solve for y and state the slope and y-intercept:

4.)  $2y = 7x - 10$

5.)  $5x + 3y = 3$

6.)  $x - 6y = 12$

7.) Graph the following linear equation:  $3y + 6 = x$



## SLOPE

Slope: \_\_\_\_\_

Slope Formula:

OR Find it by counting  $\frac{\text{\# of spaces up or down}}{\text{\# of spaces to the right}}$

\* You should always write slope as a \_\_\_\_\_ and use \_\_\_\_\_ to represent slope.

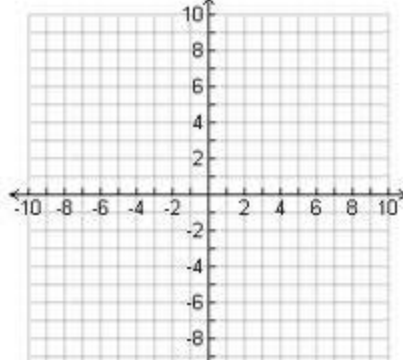
Find the slope of the line between the two points two ways, using the formula and by graphing.

**Formula**

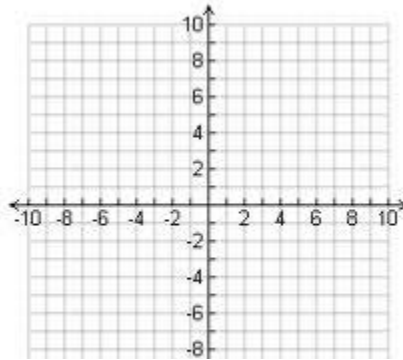
**Graph**

**The slope is:**

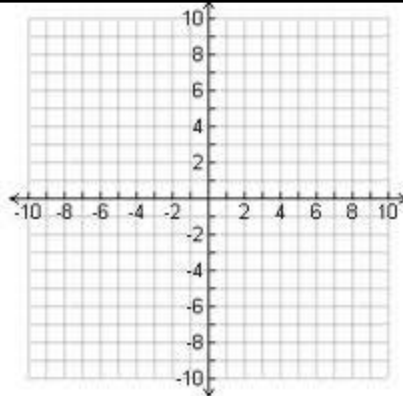
1.) (4,8) (6,-2)



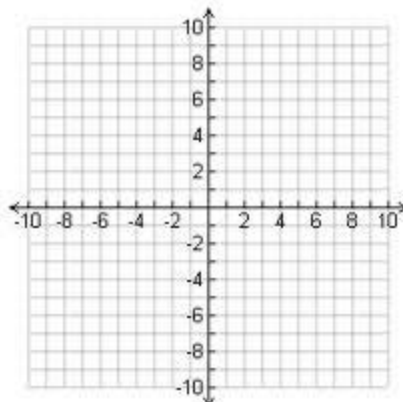
2.) (6,-2) (6,7).



3.) Write the equation of the line that pass through (4,-5) (6,-8)



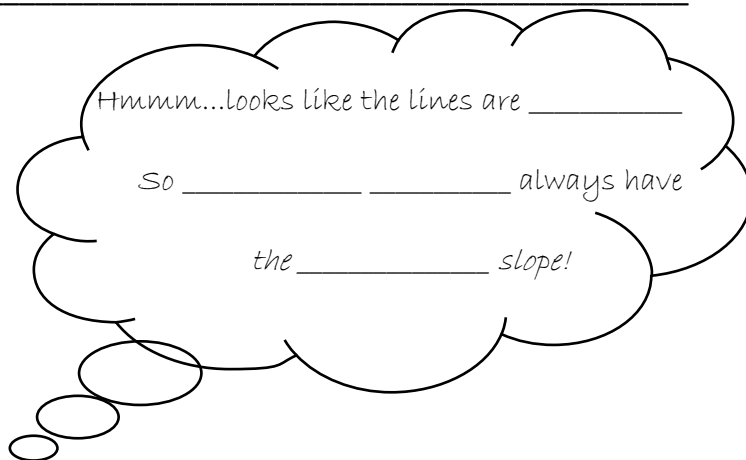
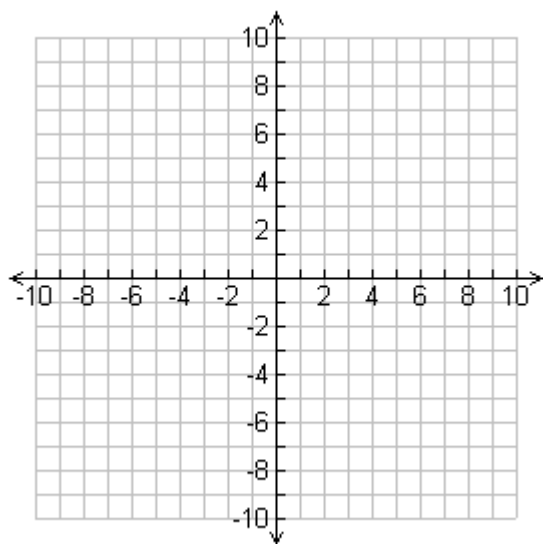
4.) Write the equation of a line that passes through (4,-3) (-3,-3).



- 5.) a.) Using the slope formula, find the slopes of the lines passing through the following points:  
 $(-6,1)$  and  $(3,7)$   $(0,-9)$  and  $(9,-3)$

b.) What do you notice about their slopes? \_\_\_\_\_

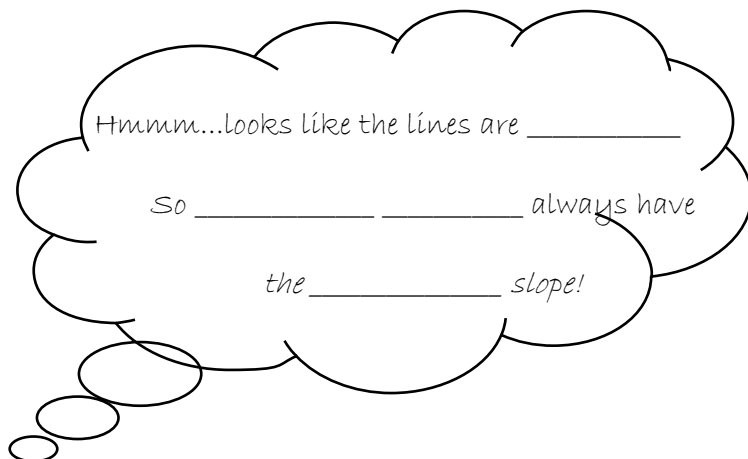
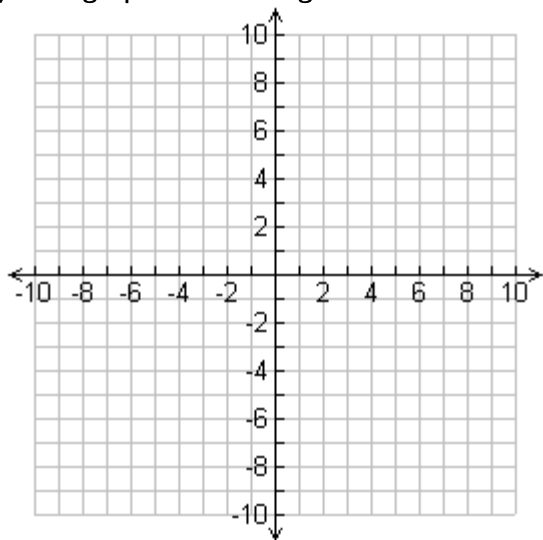
c.) Now graph the line segments:



- 6.) a.) Using the slope formula, find the slopes of the lines passing through the following points:  
 $(-3,1)$  and  $(6,4)$   $(-2,8)$  and  $(1,-1)$

b.) What do you notice about the slopes? \_\_\_\_\_

c.) Now graph the line segments:



**NOTE:** There is one exception to this rule; a horizontal line is perpendicular to a vertical line but their slopes are not negative reciprocals of each other.

Their slopes are \_\_\_\_\_ and \_\_\_\_\_

**Writing equations of lines parallel and perpendicular to given lines.**

**Remember:**

Lines that are parallel have \_\_\_\_\_

Lines that are perpendicular have \_\_\_\_\_

Identify the slope of each line given then write an equation of *any* line that would be parallel to that line:

1.)  $y=2x+7$

2.)  $4y=x-3$

3.)  $2y+2=3x$

Identify the slope of each line given then write an equation of any line that would be perpendicular to that line:

4.)  $y=-2x+4$

5.)  $3y=5x-1$

6.)  $4y-1=-x$

## Writing equations of Parallel and Perpendicular lines through a given point

### RECALL:

Slopes of parallel lines are \_\_\_\_\_.

Slopes of perpendicular lines are \_\_\_\_\_.

The general form of the equation of a line:

Given the following point and slope, write the equation of a line in standard form:

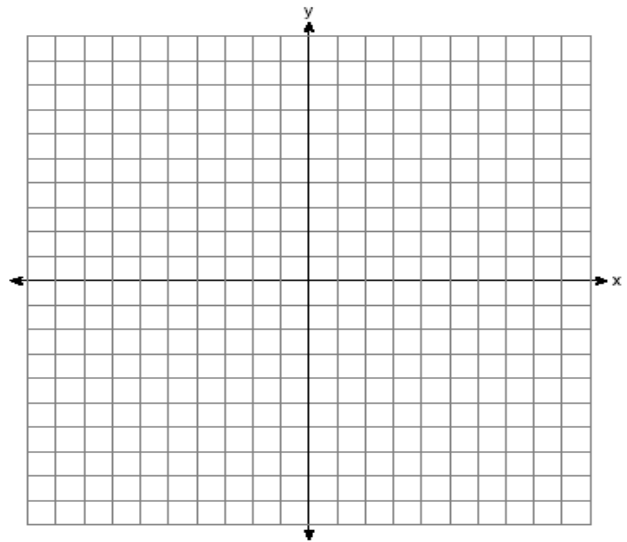
1.)  $m=3$   
 $(-1,4)$

2.)  $m=1/2$   
 $(6,1)$

3.)  $m= -1$   
 $(-3,5)$

### Writing equations of lines parallel:

4.) Write an equation of a line that is *parallel* to  $y= -4x+3$  that contains the point  $(1,-2)$ . (Try using the graph to help).

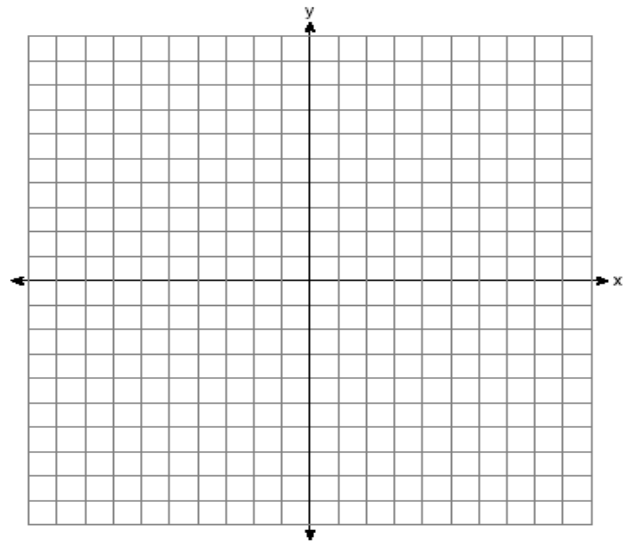


5.) Write the equation of a line *parallel* to  $x=8$  and goes through  $(4,-2)$

6.) Write an equation of a line that is parallel to  $6x-3y=9$  that contains the point  $(-5,-8)$ .

**Writing equations of lines perpendicular:**

7.) Write an equation for the line through  $(-3,7)$  and perpendicular to  $y = -3x-5$ .



8.) Write the equation of a line that is perpendicular to  $x=8$  and goes through  $(4,-2)$

9.) Write an equation for the line that contains  $(10,0)$  and is perpendicular to  $5x+2y=1$ .

## MIDPOINT

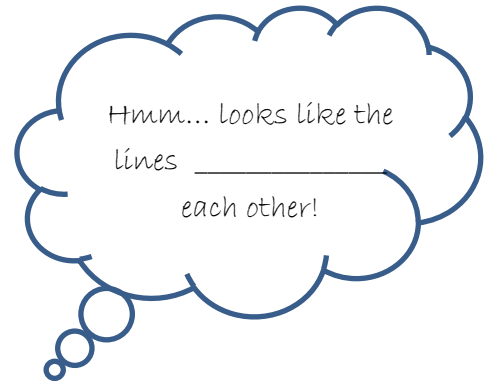
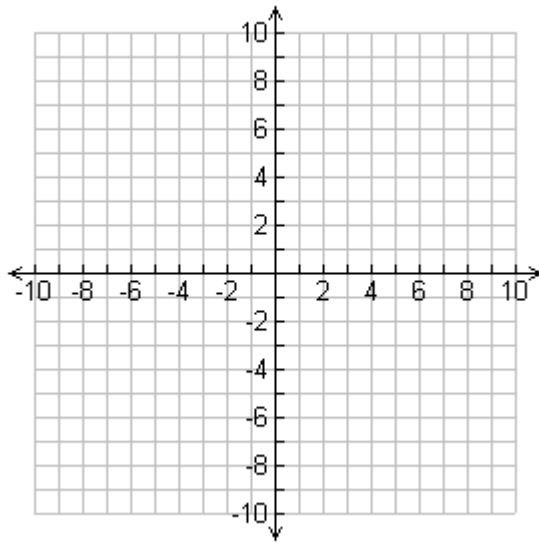
**Midpoint** of a line segment \_\_\_\_\_

**Midpoint Formula:** The midpoint M of AB with endpoints  $A(x_1, y_1)$  and  $B(x_2, y_2)$  are the following:

*Graph the points of each segment and find the midpoints:*

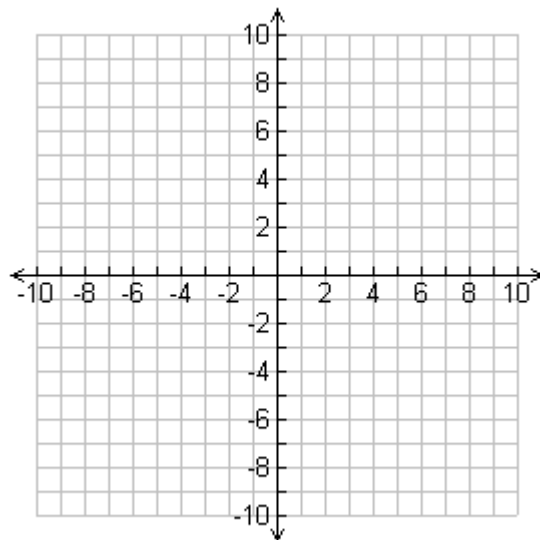
1.) Q(3,5) and S(7,-9)

2.) A(6,0) and B(4,-4)



**RULE:** If two lines have the same midpoint then the lines \_\_\_\_\_.

3.) The midpoint of AB is M(3,4). One of the endpoints is A(-3,-2). Find the coordinates of the other endpoint B.





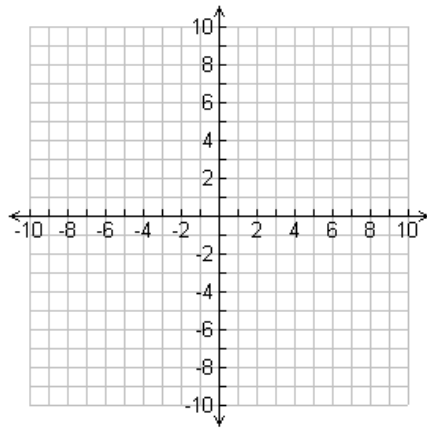
## FINDING THE DISTANCE BETWEEN TWO POINTS

Find the distance between the two points below. Use the graph to help you.

1.)  $(-2,5)$  and  $(3,5)$

2.)  $(3,5)$  and  $(3,1)$

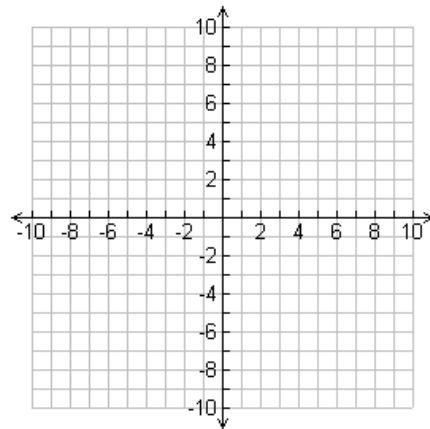
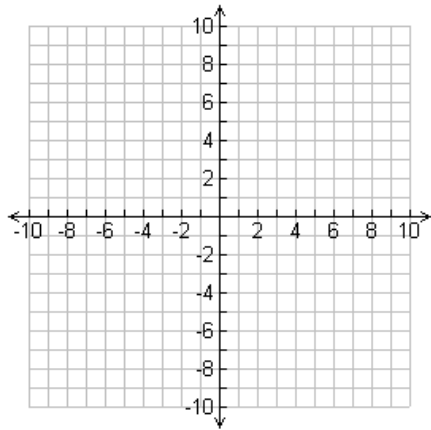
3.)  $(-2,5)$  and  $(3,1)$



Find the distance between the two points:

4.)  $(-6,2)$  and  $(4,8)$

5.)  $(0,7)$  and  $(-10, 3)$



**RULE:** If two line segments have the same distance then they are \_\_\_\_\_.

**Note:** When finding the distance between two points  
you can either use the Pythagorean Theorem or the distance formula.

## PERPENDICULAR BISECTOR

**Remember:**

**Equation of a line:** \_\_\_\_\_ where  $m =$  \_\_\_\_\_ and  $b =$  \_\_\_\_\_

**Perpendicular lines** have: \_\_\_\_\_

**To bisect a line** you find the \_\_\_\_\_

If the endpoints of a line segment are given as  $(-3,5)$  and  $(7,7)$ , find the perpendicular bisector of the line segment:

*Follow these steps:*

1.) Find the slope of the line segment:

2.) Write the slope of a line that would be perpendicular to that line:

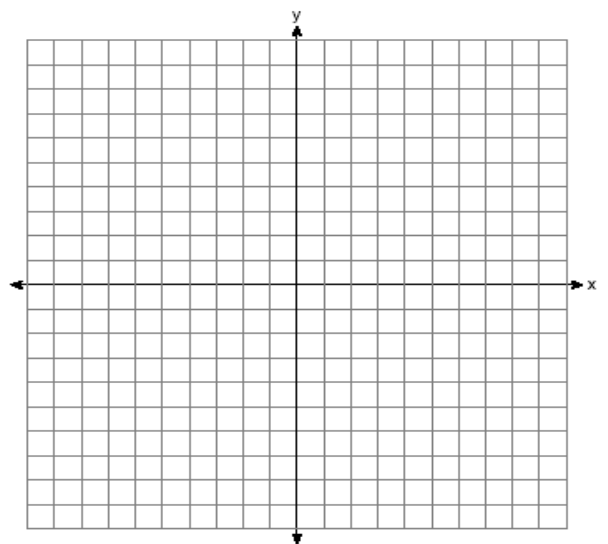
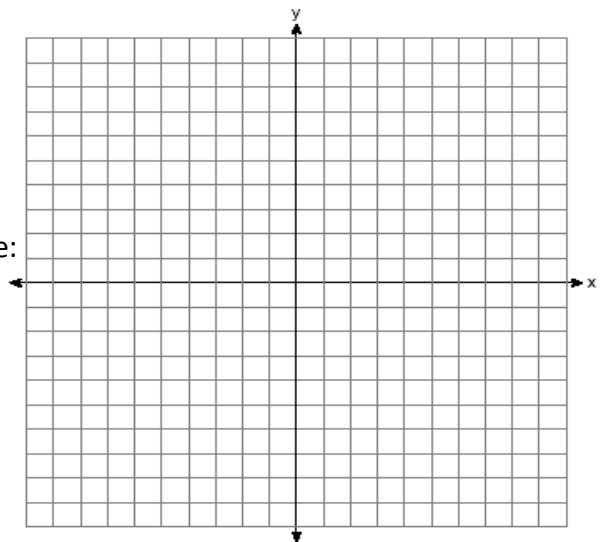
3.) What is the midpoint of the segment?

4.) What is the y-intercept of a line with the slope from #2 and that goes through the point from #3?

5.) What is the equation of a line with the slope from #2 and the y-intercept from #4?

**Now you try:**

6.) Find the perpendicular bisector of the segment joining the points  $(-10,-4)$  and  $(-2,0)$

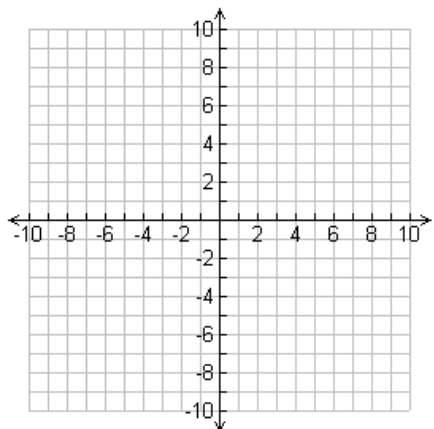


## PROVING THINGS ABOUT LINES

WHAT TO PROVE	HOW TO PROVE	FORMULA TO USE
Lines are PARALLEL		
Lines are NOT PARALLEL		
Lines are PERPENDICULAR		
Lines BISECT EACH OTHER		
Lines are CONGRUENT		

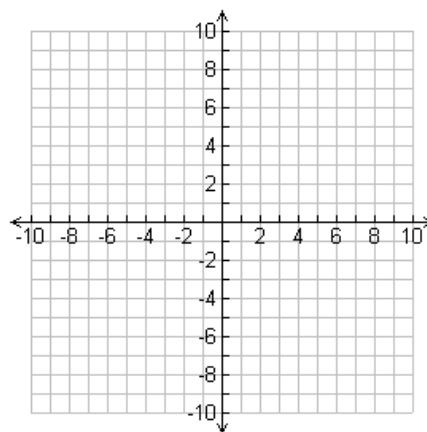
1.) Prove that AB and CD bisect each other if

A(-1,-3) B(3,3) C(-3,3) D(5,-3)



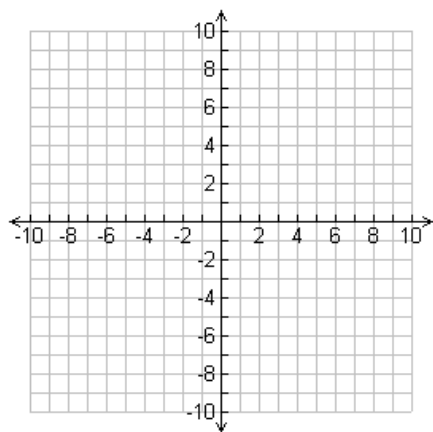
2.) Prove  $EF \perp GH$  if

E(2,-2) F(4,2) G(1,1) H(5,-1)



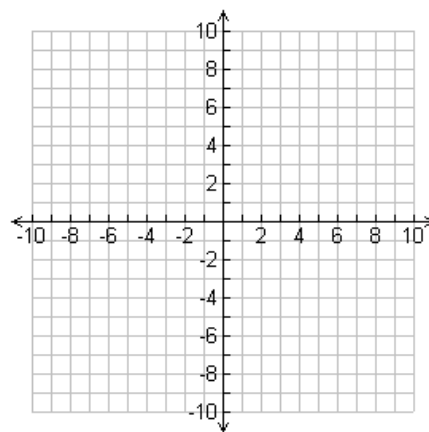
3.) Prove that  $WX \parallel YZ$  if

W(1,1) X(5,4) Y(-2,-5) Z(2,-2)



4.) Prove that  $MN \cong PO$  if

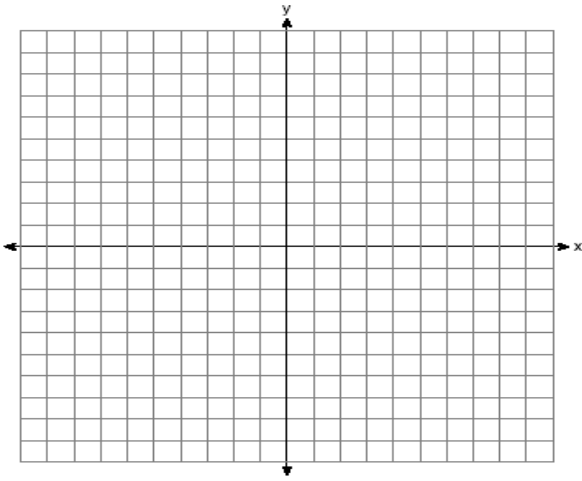
M(-8,1) N(-2,-1) O(3,2) P(1,-4)



## PROVING TRIANGLES/TRAPEZOIDS

1.) **Given:**  $R(1,-1)$ ,  $U(6,-1)$ ,  $N(1,-7)$ .

**Prove:** RUN is a right triangle

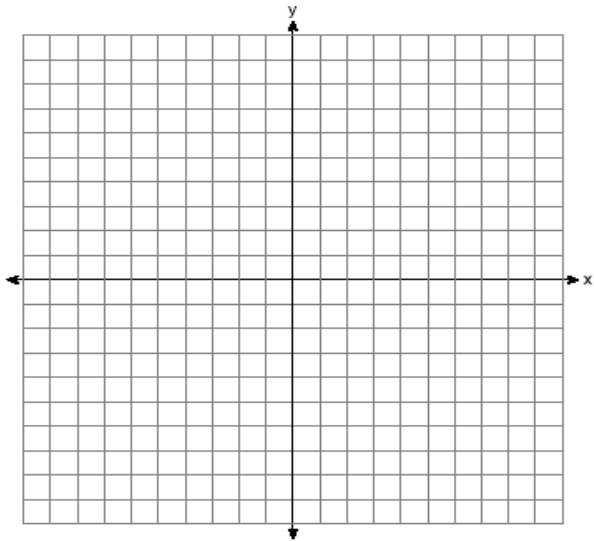


What are we really trying to do? \_\_\_\_\_

How are we going to do that? \_\_\_\_\_

2.) **Given:**  $R(-4,0)$ ,  $I(0,1)$ ,  $C(4,-1)$ ,  $K(-4,1)$

**Prove:** RICK is a Trapezoid

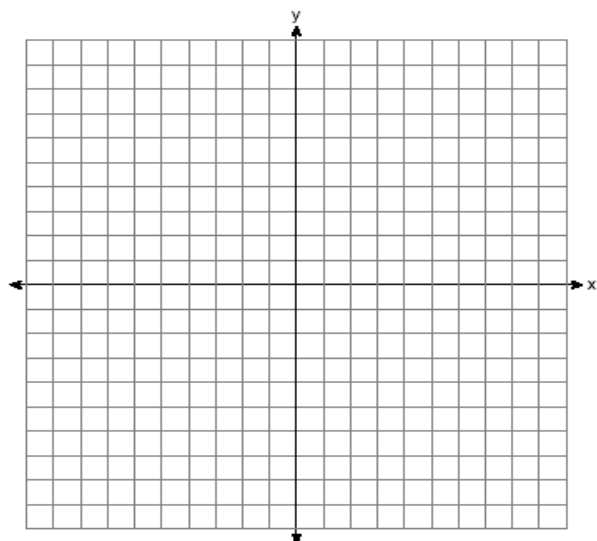


Come up with a plan. What are you trying to do? How are you going to do it?

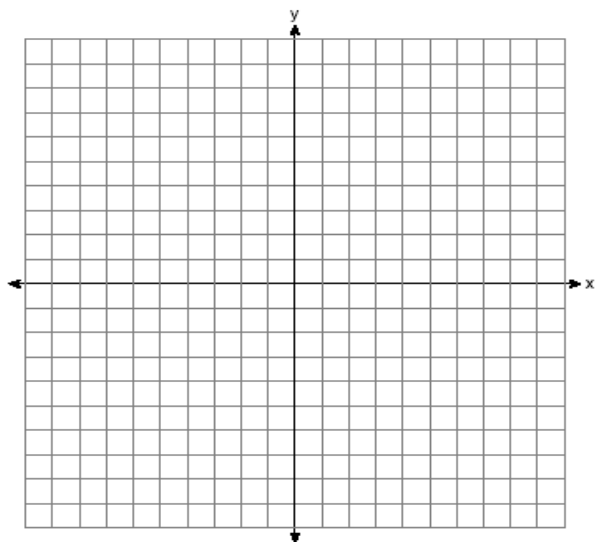
WRITE IT!!!

3.) **Given:**  $A(-6,9)$ ,  $B(10,-3)$  and  $C(-4,-5)$   
**Prove:** ABC is an isosceles right triangle

**Remember to  
plan ahead!**



4.) **Given:**  $M(1,3)$ ,  $A(-1,1)$ ,  $R(-1,-2)$ ,  $K(4,3)$   
**Prove:** MARK is an Isosceles Trapezoid



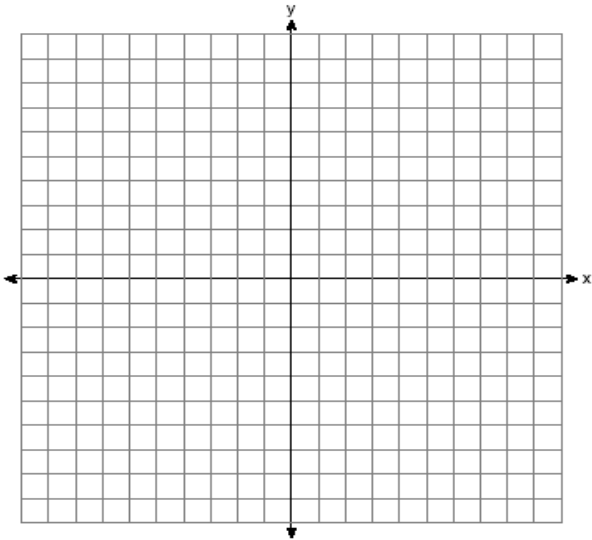
## PROVING PARALLELOGRAMS USING COORDINATE GEOMETRY

WAYS TO PROVE	How would we do this using coordinate geometry?
1.) Prove that BOTH PAIRS of opposite sides are	
2.) Prove that BOTH PAIRS of opposite sides are	
3.) Prove that BOTH PAIRS of opposite angles are	
4.) Prove that diagonals	
5.) Prove that One Pair of opposite sides are both and	

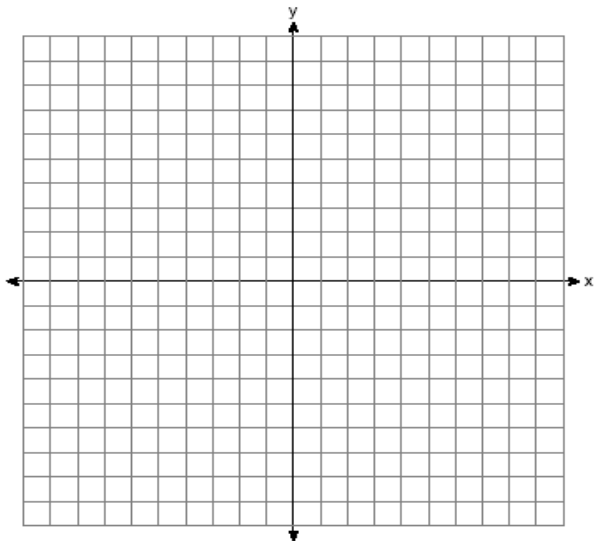
Let's pick a way and use it for all parallelograms!!!!

Failing to plan is planning to fail!

- 1.) Prove that JOYS with vertices J(1,1) O(2,-6), Y( 3,3) S(2,10) is a parallelogram



- 2.) If three of the points of a parallelogram are (-1,2), (4,6), (6,0) find the other point. Justify your answer:



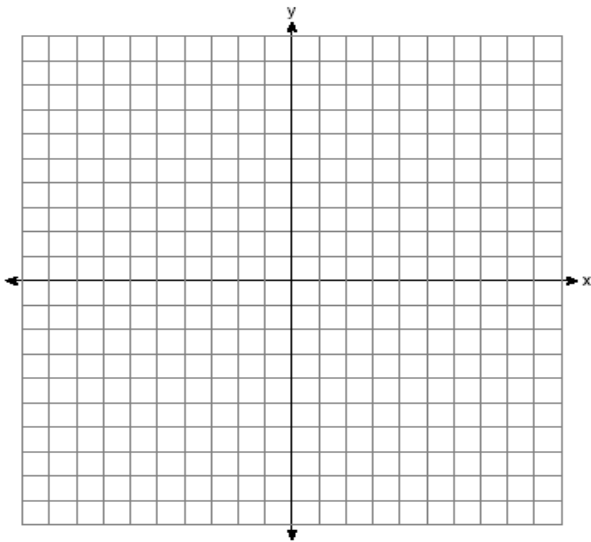
# PROVING RECTANGLES USING COORDINATE GEOMETRY

WAYS TO PROVE	HOW ARE WE GOING TO DO THIS USING COORDINATE GEOMETRY?
1.) Prove that it is a PARALLELOGRAM with	
2.) Prove that it is a PARALLELOGRM with	
3.) Prove that all angles are	

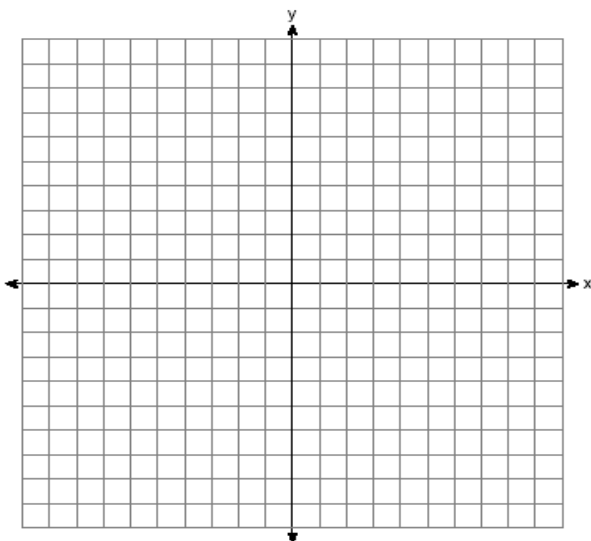
Let's pick a way and stick with it!

1.) Prove that SNOW with vertices S(-3,0), N(4,7), O(9,2), and W(2,-5) is a rectangle

*Failing to plan is planning to fail!*



2.) Find the coordinates of E if CHER is a Rectangle C(0,2) H(4,8) E(x,y) R(3,0). Justify your answer.



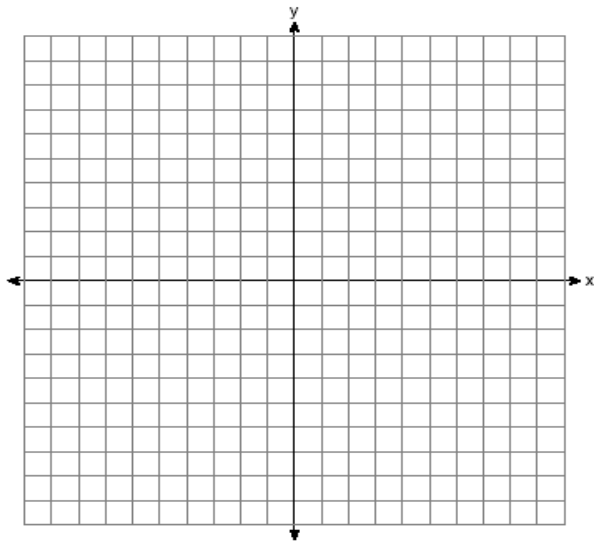
# PROVING RHOMBUSES USING COORDINATE GEOMETRY

WAYS TO PROVE	HOW ARE WE GOING TO DO THIS USING COORDINATE GEOMETRY?
1.) Prove that it is a PARALLELOGRAM with	
2.) Prove that it is a PARALLELOGRAM with	
3.) Prove that all sides are	

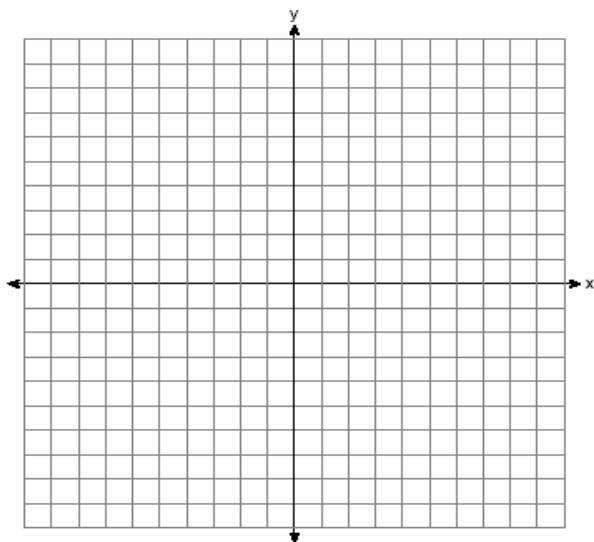
Let's pick a way and stick with it!!!!

- 1.) Given NEWY with coordinates N(1,5) E(-1,2) W(1,-1) Y(3,2) prove NEWY is a rhombus

*Failing to plan is planning to fail!*



- 2.) If the coordinates of RHOM are R(-1,5), H(-4,1), O(-1,-3), M(x,y). Find x & y. Justify your answer.



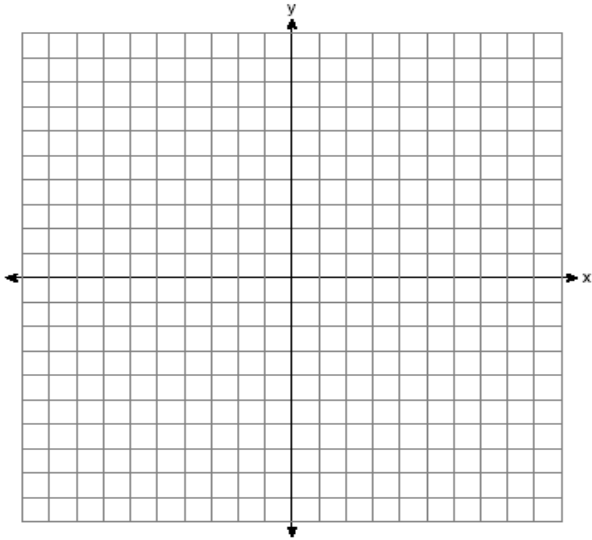


# PROVING A SQUARE USING COORDINATE GEOMTERY

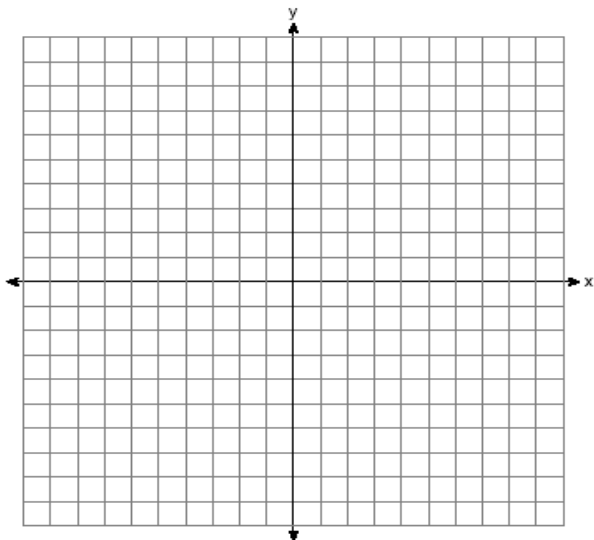
WAYS TO PROVE	HOW ARE WE GOING TO DO THIS USING COORDINATE GEOMETRY?
1.) Prove that it is a RECTANGLE with	
2.) Prove that it is a RHOMBUS with	

1.) Given YEAR with coordinates Y(1,-4) E(3,0) A (-1,2) R(-3,-2) prove YEAR is a square

*Failing to plan is planning to fail!*

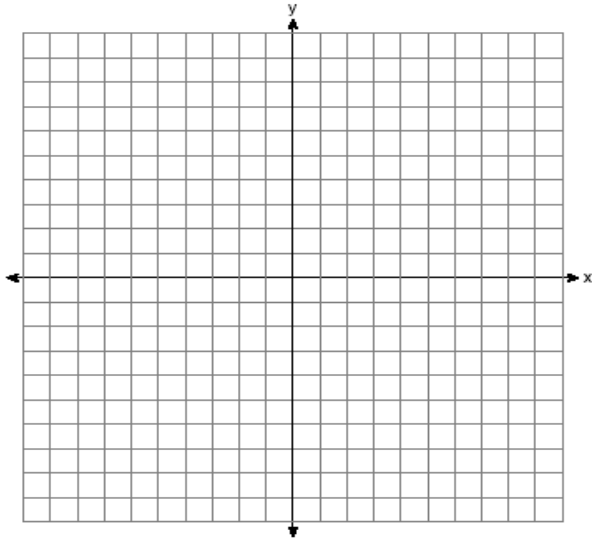


2.) If SQUA is a square, find the coordinates of S(a,b) given Q(-4,-4), U(2,2), A(8,-4). Justify your answer.



### WHAT SHAPE?

1.) If quadrilateral ABCD has coordinates:  $A(2, 3)$ ,  $B(-4, 3)$ ,  $C(-2, 6)$ ,  $D(1, 6)$ , what type of quadrilateral is ABCD? Justify your answer.



2.) If quadrilateral ABCD has coordinates:  $A(0, 6)$ ,  $B(3, 3)$ ,  $C(0, -5)$ ,  $D(-3, 3)$ , what type of quadrilateral is ABCD? Justify your answer.

