

PLAN

Systems (Comparison method)  
MHS

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Find Coordinates

- midpoint
- division point -ratio (transform  $\frac{Part: Part}{Whole} \rightarrow \frac{FirstPart}{Whole}$ )
- fraction (leave)
- systems of linear relations
  - comparison
  - substitution
  - elimination
- Interecepts ( $y=ax+b$ )

Find Distance: Need 2 coordinates

Find an equation Find a(slope) and b(y-int)

a:

formula  $a = \frac{y_2 - y_1}{x_2 - x_1}$

parallel (same slopes)  $a_1 = a_2$

perpendicular  $a_1 = \frac{-2}{3} \rightarrow \frac{2}{3} \rightarrow \frac{3}{2} \rightarrow \frac{3}{2}$   
(transform fraction flip the fraction and change the sign)

b:

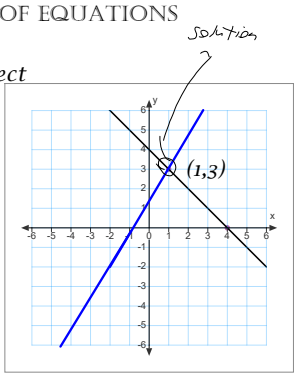
$y = ax+b$  and solve for b or b:  $y-ax$

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SYSTEMS OF EQUATIONS

Where two lines intersect  
Coordinates

Solution: the value of x and y at the point of intersection.



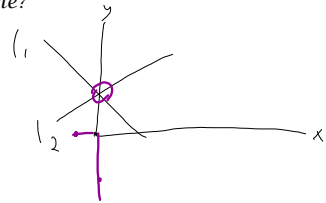
1. Can be found by reading a graph

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2. Can be found by reading a table:

x	$y_1$	$y_2$
-2	-3	7
-1	-1	4
0	1	1
1	3	-2
2	5	-5

What are the values of x and y at the same point on each line?



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3. Can be found algebraically:

COMPARISON METHOD

Used when both equations are in functional form

$y_1 = y_2$

ex:

$$y_1 = 2x + 9$$

$$y_2 = -3x - 1$$

$2x + 9 = -3x - 1$

$$2x + 3x = -1 - 9$$

$$5x = -10$$

$$x = -2$$

$y = 2x + 9$

$$y = 2(-2) + 9$$

$$y = 5$$

Steps:

1. Equate  $y_1$  to  $y_2$ .
2. Move all your variable to one side, constants to the other
3. solve for x
4. Input value of x into one of the equations to solve for y

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$y = -x - 8$

$y = -2x + 1$

$-x - 8 = -2x + 1$

$-x + 2x = 1 + 8$

$x = 9$

$y = -x - 8$

$y = -9 - 8$

$y = -17$

$x = 9$

$y = -17$

$(9, -17)$

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