Try this: a typical college entrance type of question.

If $(16)(3)^2 = x(2^3)$, then $x =$

(A) 81 (B) 72 (C) 18 (D) 16 (E) 8

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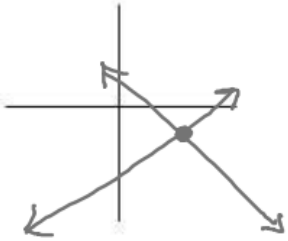
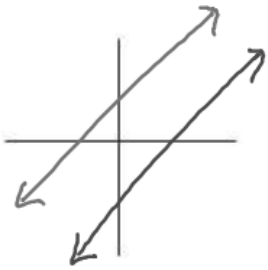
Systems of *Linear* Equations have 3 possible types of solutions

**Draw a sketch of two lines for each situation:**

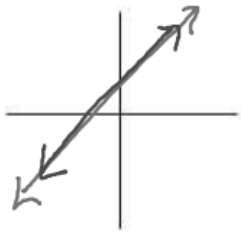
**One solution**



**No Solutions**



**Infinitely Many Solutions**



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**Example #1** Graph $\begin{cases} y = 2x - 4 \\ y = x + 1 \end{cases}$

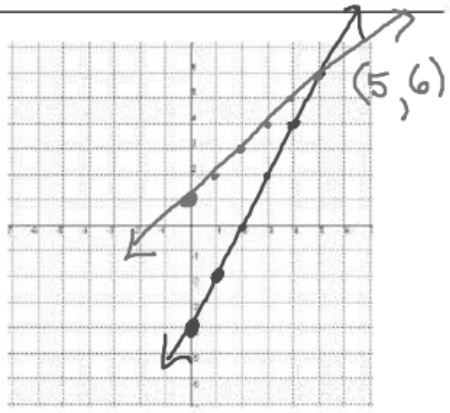
$m = \frac{2}{1}$ $b = -4$

$m = \frac{1}{1}$ $b = 1$

Find the point where the lines cross, usually called the solution point.

What is the solution point?

(5, 6)

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**Example #2** Graph $\begin{cases} x - y = 2 \\ -2x + 3y = 3 \end{cases}$

$x - y = 2$

$-x \quad -x$

$-1(-y) = -1(x + 2)$

$y = x - 2$ $m = \frac{1}{1}$ $b = -2$

$-2x + 3y = 3$

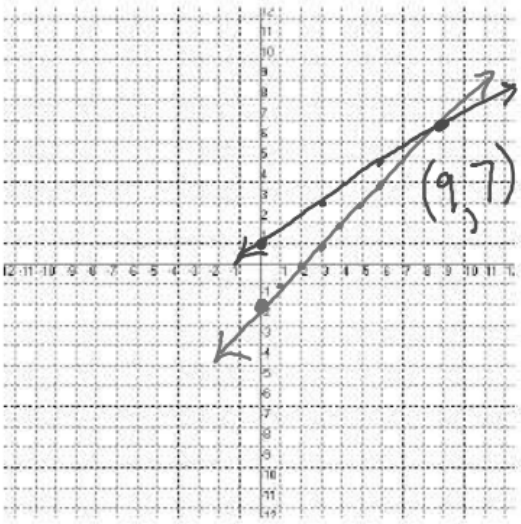
$+2x \quad +2x$

$\frac{3y}{3} = \frac{2x + 3}{3}$

$y = \frac{2}{3}x + 1$ $m = \frac{2}{3}$ $b = 1$

What is the solution point?

(9, 7)



**Example #3** Graph $\begin{cases} x+2y=2 \\ 2x+4y=16 \end{cases}$

$x+2y=2$

$\frac{2y}{2} = \frac{-x+2}{2}$ $\quad m=-\frac{1}{2}$

$y=-\frac{1}{2}x+1$ $\quad b=1$

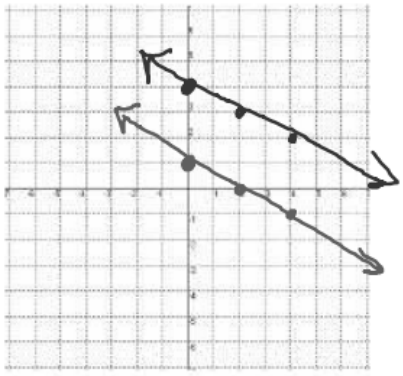
$2x+4y=16$

$\frac{4y}{4} = \frac{-2x+16}{4}$

$y=-\frac{1}{2}x+4$

$m=-\frac{1}{2}$

$b=4$



What is the solution point?

( , ) no solution

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**Example #4** Graph $\begin{cases} 2x+3y=12 \\ 2x-y=4 \end{cases}$

$2x+3y=12$

$3y=2x+12$

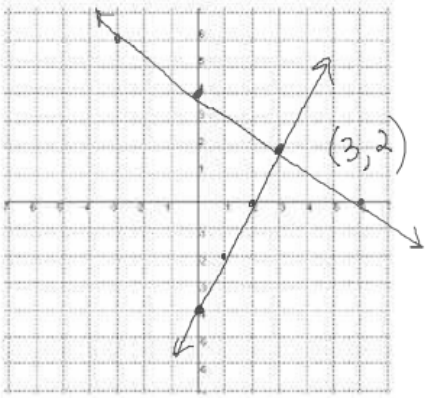
$y=\frac{-2}{3}x+4$

$m=\frac{-2}{3}$ $\quad b=4$

$2x-y=4$

$-y=-2x-4$

$y=2x-4$




What is the solution point?

( 3 , 2 )

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**Example #5** Graph $\begin{cases} y=-x+3 \\ 4x+4y=12 \end{cases}$

$y=-x+3$

$m=-\frac{1}{1}$

$b=3$

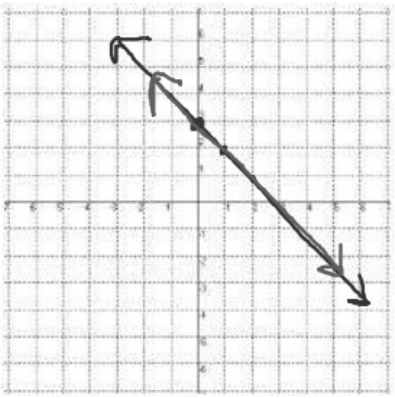
$4x+4y=12$

$4y=-4x+12$

$y=-x+3$

$m=-1$

$b=3$



What is the solution point?

( , )

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***Homework!!***

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