Algebra II

SS-1

Systems of Linear Equations in Two Variables

Solving Systems - The Graphing Method (pg 218)

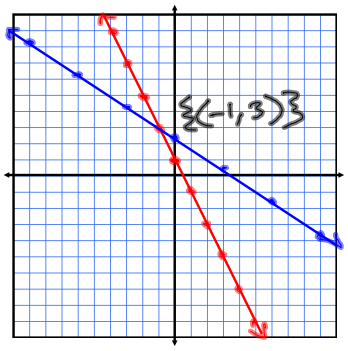
1) $2x + y = 1$
$2x + 3y = 7$

$y = -2x + 1$
$m = -2$
$b = 1$

$\frac{3y}{3} = \frac{-2x}{3} + \frac{7}{3}$

$y = -\frac{2}{3}x + \frac{7}{3}$

$m = -\frac{2}{3}$ $b = \frac{7}{3}$



Solving Systems - The Substitution Method

1) $2x + y = 1$ → $y = -2x + 1$
$2x + 3y = 7$

$2x + 3(-2x + 1) = 7$

$2x - 6x + 3 = 7$

$-4x = 4$

$x = -1$

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

$2 + 1 = y$

$3 = y$

$\{(-1, 3)\}$

Solving Systems - The Linear Transformation Method

1) $2x + y = 1$ (-1) → $-2x - y = -1$
$2x + 3y = 7$ + $2x + 3y = 7$

$2y = 6$

$y = 3$

$2x + (3) = 1$

$2x = -2$

$x = -1$

$\{(-1, 3)\}$

Methods for Solving Systems

	Pros	Cons
Graphing	Easy if both are in $y = mx + b$ form	Long, Might cross off the graph, inaccurate
Substitution	Use when it's easy to get a variable alone.	Can turn into ugly Fractions Fast!
Linear Transformation	Usually easiest and fastest	Comparitively none.

13) $y = -x + 3$
$y = x - 4$ +

$2y = -1$

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

$\left(-\frac{1}{2}\right) = x - 4$

$3\frac{1}{2} = x$

$\{(\frac{7}{2}, -\frac{1}{2})\}$

17) $3x + 3y = 6$
$5x - 6y = 15$

$\times 2$ and $\times \frac{1}{3}$

$6x + 6y = 12$
$5x - 6y = 15$
$11x = 27$
$x = \frac{27}{11}$

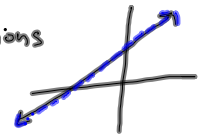
$x + y = 2$
$\frac{27}{11} + y = 2$
$y = 2 - \frac{27}{11}$
$y = \frac{22}{11} - \frac{27}{11}$
$= -\frac{5}{11}$

$\{(\frac{27}{11}, -\frac{5}{11})\}$

29) $3x = 4y - 4$
$4y = 3x - 3$

$3x = (3x - 3) - 4$
$3x = 3x - 7$
$0 = -7$
$\varnothing$

$0 = 0$
infinite solutions



33) $\frac{6}{u} + \frac{3}{v} = 2$
$\frac{2}{u} - \frac{9}{v} = 4$

$\times 3$

$\frac{18}{u} + \frac{9}{v} = 6$
$\frac{2}{u} - \frac{9}{v} = 4$
$\frac{20}{u} = 10$
$u = 2$

$\frac{2}{2} - \frac{9}{v} = 4$
$1 - \frac{9}{v} = 4$
$-\frac{9}{v} = 3$
$\frac{9}{v} = -3$
$v = -3$

$\{(2, -3)\}$

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