

Chapter 6

Solving Systems

Systems of Equations

- A system of equations: 2 equations
- The solution to the system: an ordered pair (x,y)
 - The ordered pair must work in BOTH equations
- **Ways to Find the Solution**
 - 1. By Graphing
 - 2. By Substitution
 - 3. By Elimination
- **If 2 lines parallel:** No Solution
- **If 2 lines the same:** All points on line.

6.1 Solve by Graphing

- Solution (x,y) point where they cross
- Form 1: Slope $y = mx + b$
 - Use: $m =$ $b =$
- Form 2: Standard $Ax + By = C$
 - Use $x =$ $y =$ (Intercepts)

6.2 Substitution

- Plug one equation into the other
- Ex: $2x - 3y = -1$
- $y = x - 1$
- $2x - 3(x - 1) = -1$ $y = x - 1 = 3$ $(4,3)$
- $2x - 3x + 3 = -1$
- $-1x + 3 = -1$
- $-x = -4$
- $x = 4$

6.3 Elimination

- Add two equations together,
cancels one letter

$$\begin{array}{r} \text{Ex: } 2x + 3y = 5 \\ + \quad \underline{4x - 3y = 7} \\ \hline 6x = 12 \\ x = 2 \end{array}$$

$$\begin{array}{r} 2(2) + 3y = 5 \\ 4 + 3y = 5 \\ 3y = 1 \\ y = 1/3 \end{array}$$

6.4 Multiplication with Add or Subt

- Sometimes you have to multiply one equation first, then add/subt.
- Ex: $2x + 3y = 5 \rightarrow 2(2x + 3y = 5)$
 $x - 6y = 15$ $x - 6y = 15$