The Math Center presents:

A Tip Sheet on

Solving Simultaneous Equations by the Addition Method

The ideal situation for this method is having the coefficients of either x or y be opposites. Then the equations may be added and one variable will go to zero, leaving a simple equation to solve.
If neither set of coefficients are opposites, the equation(s) may be multiplied by some constant(s) to create the opposites.

Example:

$x + y = 12$ The coefficients of y are opposites so the equations may be added

$\underline{x - y = 6}$

$2x = 18$

$x = 9$ Since $x + y = 12$ $9 + y = 12$ $y = 3$ The solution is (9, 3)

Example:

$2x + y = 4$ The coefficients of y have opposite signs but not opposite coefficients.

$\underline{3x - 2y = 6}$ Multiplying the top row by 2 will create the opposites we need.

$4x + 2y = 8$ Now these may be added.

$\underline{3x - 2y = 6}$

$7x = 14$

$x = 2$ Since $2x + y = 4$ $4 + y = 4$ $y = 0$

The solution is (2, 0)

Example:

$5x - 15y = 30$ If the first equation is multiplied by 2 and the second equation is

$-2x - 5y = 10$ multiplied by 5, the coefficients of x will be opposites. Another option is to multiply the second equation by –3 and the y coefficients would be opposites.

$10x - 30y = 60$

$-10x - 25y = 50$

$-55y = 110$

$y = -2$ Since $5x - 15y = 30$ $5x + 30 = 30$ $5x = 0$ $x = 0$

The solution is (0, -2)

MCC offers a **Math Lab** at both the Bedford and Lowell campuses. Tutoring is available weekdays and some evenings, at no charge. Schedules are posted on the door. Drop in.
In Bedford: AR 214, Tel: (781) 280-3707
In Lowell: City Campus, Room 406, Tel. (978) 656 - 3368