

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:

$$x + y = 12$$

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

$$2x = 18$$

$$x = 9$$

The coefficients of y are opposites so the equations may be added

$$\text{Since } x + y = 12 \qquad 9 + y = 12 \qquad y = 3 \qquad \text{The solution is } (9, 3)$$

Example:

$$2x + y = 4$$

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

The coefficients of y have opposite signs but not opposite coefficients. Multiplying the top row by 2 will create the opposites we need.

$$4x + 2y = 8$$

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

Now these may be added.

$$7x = 14$$

$$x = 2$$

$$\text{Since } 2x + y = 4 \qquad 4 + y = 4 \qquad y = 0$$

The solution is (2, 0)

Example:

$$5x - 15y = 30$$

$$\underline{-2x - 5y = 10}$$

If the first equation is multiplied by 2 and the second equation is 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.

$$10x - 30y = 60$$

$$\underline{-10x - 25y = 50}$$

$$-55y = 110$$

$$y = -2$$

$$\text{Since } 5x - 15y = 30 \qquad 5x + 30 = 30 \qquad 5x = 0 \qquad x = 0$$

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