

## 8.2 Solving Systems of Equations Algebraically (Part 2)

Note Title

6/2/2015

Solve by Elimination

① label each equation

$$3x + y = -9 \quad \textcircled{1}$$

$$4x^2 - x + y = -9 \quad \textcircled{2}$$

② Rearrange the equations to line up the variables.

$$3x + y = -9$$

$$4x^2 - x + y = -9$$

③ If necessary, multiply one or both of the equations by a constant.)

unnecessary for this example  
since "y" has coeff. of 1 in  
each equation

④ Add or subtract the two equations to eliminate one of the variables

$$\begin{array}{r} 3x + y = -9 \\ -(4x^2 - x + y = -9) \\ \hline -4x^2 + 4x = 0 \end{array}$$

⑤ Solve the equation

$$-4x^2 + 4x = 0$$

$$-4x(x-1) = 0$$

↓      ↓

$$x = 0$$

$$x = 1$$

⑥ Substitute the value(s) found in step ⑤ and solve for the remaining variable.

$$3x + y = -9$$
$$y = -9 - 3x$$
$$x=0 : y = -9 - 3(0) = -9$$
$$x=1 : y = -9 - 3(1) = -12$$

$(0, -9)$   
 $(1, -12)$

⑦ Verify the solution(s).

Example : Solve using elimination

$$3x^2 - 6x + 2 - 2y = 0 \quad ①$$

$$y = x^2 + x - 5 \quad ②$$

$$3x^2 - 6x + 2 = 2y \quad ①$$

$$2(x^2 + x - 5 = y) \quad ②$$

multiply ② by 2 to get the same "y" coefficients.

$$3x^2 - 6x + 2 = 2y \quad ①$$
$$- (2x^2 + 2x - 10 = 2y) \quad ②$$

$$x^2 - 8x + 12 = 0$$

$$(x-6)(x-2) = 0$$

↓      ↓

$$x=6 \quad x=2$$

$$x=6 : y = x^2 + x - 5$$
$$y = 6^2 + 6 - 5$$
$$y = 37$$

$(6, 37)$

$$x=2 : y = 2^2 + 2 - 5$$
$$y = 1$$

$(2, 1)$

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