MATH 1010 ~ Intermediate Algebra   Chapter 4: SYSTEMS OF EQUATIONS

Section 4.2: LINEAR SYSTEMS IN TWO VARIABLES

Objectives:

✣ Solve systems of equations by elimination.
✣ Use systems of equations to solve real life problems.

3 drinks + 4 doughnuts = $10.00
2 drinks + 2 doughnuts = $ 6.00

How much is 1 doughnut?

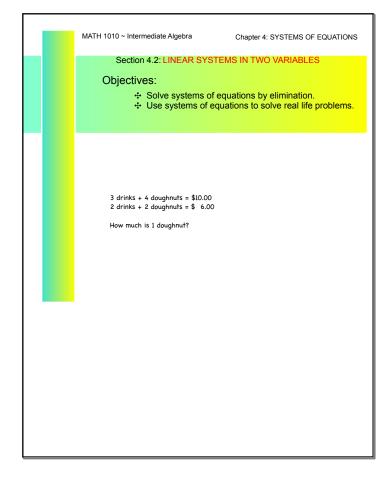
The method of elimination

1. Obtain coefficients for x (or y) that are opposites by multiplying all terms of one or both equations by suitable constants.

2. Add the equations to eliminate one variable and solve the resulting equation.

3. Back-substitute the value obtained in step 2 in either of the original equations and solve for the other variable.

4. Check your solution in both of the original equations.

$4x - 5y = 13$
$3x - y = 7$

$3x + 9y = 8$
$2x + 6y = 7$

① EXAMPLE:
Solve these systems by elimination.

a) $-x + 2y = 9$
    $x + 3y = 16$

b) $3y = 2x + 21$
    $\frac{2}{3}x = 50 + y$

c) $4x = 6 + 5y$
    $8x = 12 + 10y$

② EXAMPLE:
Solve these applications by an appropriate method.

a) An SUV costs $26,445 and an average of $0.18 per mile to maintain. A hybrid model of the SUV costs $31,910 and $0.13 to maintain.

After how many miles will the cost of the SUV exceed the cost of the hybrid?

b) A total of $1790 was made by selling 200 adult tickets and 316 children's tickets to a charity event. The next night a total of $937.50 was made by selling 100 adult tickets and 175 children's tickets.

Find the price of each type of ticket.