MATH 1010 ~ Intermediate Algebra

Section 4.2: LINEAR SYSTEMS IN TWO VARIABLES

Objectives:

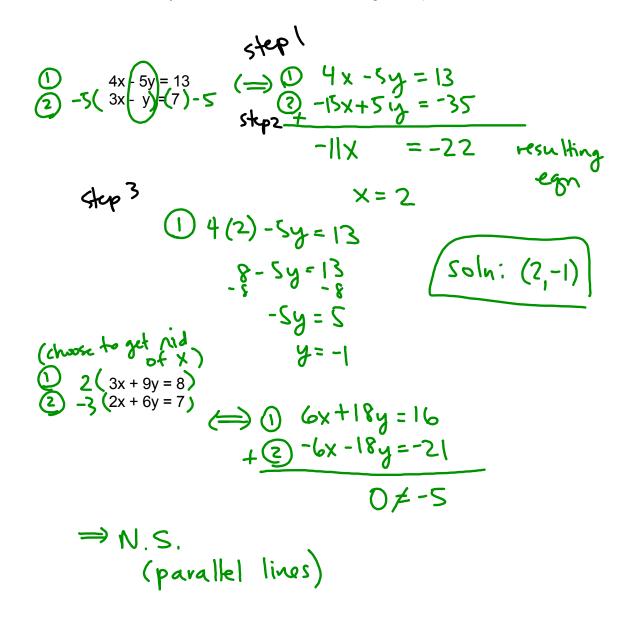
- Solve systems of equations by elimination.

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

How much is 1 doughnut?

The method of elimination

- Obtain coefficients for x (or y) that are opposites by multiplying all terms of one or both equations by suitable non-zero constants.
- 2. Add the equations to eliminate one variable and solve the resulting equation for the remaining variable.
- 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.



① EXAMPLE:

Solve these systems by elimination.

$$\begin{array}{c} (1)a) & -x + 2y = 9 \\ + & 2 & x + 3y = 16 \\ & 5y = 25 \\ & y = 5 \\ & y = 5 \\ & x + 15 = 16 \\ & x = 1 \\ \hline \\ & \text{Soln:} (1, 5) \end{array}$$

$$\begin{array}{c} (1) \\ (2) \\ (2) \\ (3)$$

⁽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?

$$cost of SUV$$
: ⁽¹⁾ 26,445 + 0.18 x = y
 $(ost of hybrid$: ⁽³⁾ 31910 + 0.13 x = y
X = ? when costs are equal
(4)
X = ? when costs are equal
(4)
X = ? (x)
 $($

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.

c = price of child tidet a = price of adult tidet