Discussion I

Systems of linear equations with 2 variables

1. You are given the following nutritional regarding steak and potatoes:

Ingredient	Grams of ingredient per serving		Daily Requirement (Grams)
	Steak	**Potatoes**	
Carbohydrate	5	15	50
Protein	20	10	40

   You wish to determine the number of daily servings of steak and potatoes that will meet these requirements. Formulate this problem as a system of linear equations and find this solution!

2. A radio assembly plant produces two models, HiFi-1 and HiFi-2 on the same assembly line. The assembly line consists of two stations. The assembly times in the workstations are:

Workstation	Minutes per unit of:	
	HiFi-1	**HiFi-2**
1	6	4
2	5	5

   Each workstation has 480 minutes per day. However, the workstations require daily maintenance which amount to 10% and 14% of the 480 minutes daily for stations 1 and 2, respectively. The company wishes to determine the daily units to be assembled of HiFi-1 and HiFi-2. Find this solution!

QUIZ I

A company can advertise its product by using local radio and TV stations. Its budgets expenditures $1000 a month. Each minute of radio advertisement costs $5 and each minute of TV advertisement costs $100. The company would like to use the radio twice as much as the TV. Determine the duration of advertising for each radio and TV?!

QUIZ I

A company can advertise its product by using local radio and TV stations. Its budgets expenditures $1000000 a month. Each minute of radio advertisement costs $5 and each minute of TV advertisement costs $100. The company would like to use the radio twice as much as the TV. Determine the duration of advertising for each radio and TV?!

Discussion II
Systems of linear equations 3 variables

1. Three Nissans, two Fords and four Chevrolets can be rented for $ 106 per day. At the same rats two Nissans, four Ford and three Chevrolets cost $ 107 per day, where as four Nissans, three Fords and two Chevrolets cost $102 per day. Find the model of this case as a system of linear equation, then solve this system!

2. The scores of three players in a tournament have been lost. The only information available is the total of the scores for player 1 and 2 is 10, the total scores for players 2 and 3 is 12, and the total scores for players 1 and 3 is 8. Find the model of this case as a system of linear equation , then solve this system!

QUIZ I

A company can advertise its product by using local radio and TV stations. Its budgets expenditures $1000000 a month. Each minute of radio advertisement costs $5 and each minute of TV advertisement costs $100. The company would like to use the radio twice as much as the TV. Determine the duration of advertising for each radio and TV?!

Quiz II

An Amusement park charges $7 for adults, $2 for youths, and $0.50 for children. If 150 people enter and pay a total of $100, Find the model of this case as a system of linear equation, then solve this system!

QUIZ III

Find the circle $x^2 + y^2 + ax + by + c = 0$ passing through the following points: (1,1),(5,-3),and (-3,-3) !

QUIZ IV

Find a, b, c such that:

$$\frac{x^2 - x + 3}{(x^2 + 2)(x - 1)} = \frac{ax + b}{x^2 + 2} + \frac{c}{2x - 1}$$

Discussion III

Solution of a System of Linear Equations

1. Show that a system consisting exactly one linear equation can have zero, one or infinitely many solutions. Give examples!
2. By examining the possible positions of lines in the plane, show that three equations in two variables can have zero, one or infinitely many solutions
3. A school has three clubs and each student is required to belong to exactly one club. One year the students switched club membership as follows:

   Club A   : 40% remain in A, 10% switch to B, 50% switch to C

   Club B   : 70% remain in B, 20% switch to A, 10% switch to C

   Club C   : 60% remain in C, 20% switch to A, 20% switch to B

   If the fraction of the student population in each club is unchanged, find each of these fractions!

QUIZ III

Find the circle $x^2 + y^2 + ax + by + c = 0$ passing through the following points:

(1,1),(5,-3),and (-3,-3) !

Discussion IV

Elementary Operation

1. Find the solution of the following system using elementary operation:

$$x + y + 2z - w = 4$$
$$3y - z + 4w = 2$$
$$x + 2y - 3z + 5w = 0$$
$$x + y - 5z + 6w = -3$$

2. Find a sequence of elementary operation to obtain the solution of the following system:

$$a + 2b - c + 2d = 9$$
$$-2a + b + 2c - d = 2$$

Give the solution in the parametric form for all possible ways!

QUIZ IV

Find a,b,c such that:

$$\frac{x^2 - x + 3}{\left(x^2 + 2\right)\left(2x - 1\right)} = \frac{ax + b}{x^2 + 2} + \frac{c}{2x - 1}$$

Discussion V

Augmented Matrix

Elementary Row Operation

1. Find the solution of the following system of linear equation using augmented matrix:

$$2x + y + z = -1$$
$$x + 2y + z = 0$$
$$3x - 2z = 5$$

2. Show that the following system has no solution unless $c = 2b - 3a$:

$$x + 2y - z = a$$
$$2x + y + 3z = b$$
$$x - 4y + 9z = c$$

QUIZ I

A company can advertise its product by using local radio and TV stations. Its budgets expenditures $1000000 a month. Each minute of radio advertisement costs $5 and each minute of TV advertisement costs $10000000. The company would like to use the radio twice as much as the TV. Determine the duration of advertising for each radio and TV?!

Quiz II

An Amusement park charges $7 for adults, $2 for youths, and $0.50 for children. If 150 people enter and pay a total of $100, Find the model of this case as a system of linear equation, then solve this system!

QUIZ III

Find the circle $x^2 + y^2 + ax + by + c = 0$ passing through the following points: (1,1),(5,-3),and (-3,-3) !

QUIZ IV

Find a,b,c such that:

$$\frac{x^2 - x + 3}{(x^2 + 2)(2x - 1)} = \frac{ax + b}{x^2 + 2} + \frac{c}{2x - 1}$$

QUIZ V

Using the elementary row operation to solve the following system:

$-x + 2y - z + w = 6$
$2x + y + z - 3w = 9$
$x + y - 2w = 14$
$4x + y + z + w = 10$