

## Exercise

**Q2:** For the LP, answer the following questions?

2-  $\text{Max } Z = 3X_1 + 2X_2$  **H.W**

Subject to

$$2X_1 + 4X_2 \leq 8$$

$$X_1 + X_2 \leq 2$$

$$X_1 \geq 0, X_2 \geq 0$$

- Express the problem in equation form.
- Determine the all basic solutions and classify them as feasible and infeasible.
- Use direct substitution in the objective function to determin the optimum basic feasible solution.
- Verify graphically that the solution obtained in (c) is the optimum LP solution.

The standard form

$$\text{Max } Z = 3X_1 + 2X_2$$

Subject to

$$2X_1 + 4X_2 + S_1 = 8$$

$$X_1 + X_2 + S_2 = 2$$

$$X_1 \geq 0, X_2 \geq 0, S_1 \geq 0, S_2 \geq 0 \quad (\text{S is slack variable})$$

We have  $m=2$  constraints and  $n=4$  variables, thus  $n-m=2$  Nonbasic variables (which =0).

Nonbasic Variables	Basic Variables	Basic Solution	Feasibility Status	Extreme point	Objective Value
$S_1, S_2$	$X_1, X_2$	0,2	Feasible	B	4
$S_2, X_2$	$X_1, S_1$	2,4	Feasible	C	6
$S_1, X_2$	$X_1, S_2$	4,-2	Infeasible		
$S_2, X_1$	$X_2, S_1$	2,0	Feasible	B	4
$S_1, X_1$	$X_2, S_2$	2,0	Feasible	B	4
$X_1, X_2$	$S_1, S_2$	8,2	Feasible	A	0

Commented [BM1]: كتاب العليان صفحة 73  
الحل بكتاب الشبيحه و العليان صفحة 73

