

## Exercice 4

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أوجد الصورة القياسية لمسائل البرمجة الخطية

$$1- \text{Min } Z = 3X_1 + 8X_2 + 4X_3$$

Subject to

$$X_1 + X_2 \geq 8$$

$$2X_1 - 3X_2 \leq 0$$

$$X_2 \geq 9$$

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

The standard form

$$\text{Min } Z = 3X_1 + 8X_2 + 4X_3^+ - 4X_3^-$$

Subject to

$$X_1 + X_2 - S_1 = 8$$

$$2X_1 - 3X_2 + S_2 = 0$$

$$X_2 - S_3 = 9$$

$$X_1 \geq 0, X_2 \geq 0, X_3^+ \geq 0, X_3^- \geq 0, S_1 \geq 0, S_2 \geq 0, S_3 \geq 0$$

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$$2- \text{Max } Z = 5X_1 + 4X_2$$

Subject to

$$6X_1 + 4X_2 \leq 24$$

$$X_1 + 2X_2 \leq 6$$

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

The standard form

$$\text{Max } Z = 5X_1 + 4X_2$$

Subject to

$$6X_1 + 4X_2 + S_1 = 24$$

$$X_1 + 2X_2 + S_2 = 6$$

$$X_1 \geq 0, X_2 \geq 0, S_1 \geq 0, S_2 \geq 0$$

Basic Variables	Basic Solution	Feasibility Status	Objective Value
$X_1, X_2$	3,1.5	Feasible	21
$X_1, S_1$	6,-12	Infeasible	_____
$X_1, S_2$	4,0	Feasible	20
$X_2, S_1$	3,12	Feasible	15
$X_2, S_2$	6,-6	Infeasible	_____
$S_1, S_2$	24,6	Feasible	0