

سلسلة تمارين:

حل باستعمال طريقة "simplex" البرامج الخطية التالية مع اكتشاف الحالات الخاصة إن وجدت:

1/

$$\begin{aligned} \text{Max } Z &= 10x_1 + 2x_2 + 12x_3 + 4x_4. \\ 8x_1 + 8x_2 + 8x_3 + 2x_4 &\leq 88. \\ 16x_1 + 12x_2 + 8x_3 + 6x_4 &\leq 72. \\ x_1, x_2, x_3, x_4 &\geq 0. \end{aligned}$$

2/

$$\begin{aligned} \text{Max } Z &= 6x_1 + 10x_2 + 3x_3 \\ 5x_1 + 3x_2 + 4x_3 &\leq 15 \\ 4x_1 + 8x_2 + 12x_3 &\leq 16 \\ 2x_1 + 2x_2 + 8x_3 &\leq 8 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

3/

$$\begin{aligned} \text{Max } Z &= 4x_1 + 5x_2 \\ x_1 + x_2 &\geq 80 \\ 3x_1 + 2x_2 &\geq 75 \\ x_1, x_2 &\geq 0 \end{aligned}$$

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$$\begin{aligned} \text{Max } Z &= x_1 + x_2 \\ 2x_1 + 1x_2 &\leq 8 \\ 1x_1 + 3x_2 &\leq 9 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

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$$\begin{aligned} \text{Max } Z &= 2x_1 - 8x_2 + 10x_3 \\ 6x_1 + 3x_2 + 3x_3 &\leq 12 \\ 4x_1 - 4x_2 - 4x_3 &\leq 8 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

6/

$$\begin{aligned} \text{Min } Z &= 4x_1 + 18x_2 + 2x_3 \\ 2x_1 + 6x_3 &\leq 14 \\ x_1 + 17x_2 + 15x_3 &\geq 25 \\ 6x_1 + 6x_2 + 21x_3 &\geq 30 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

7/

$$\begin{aligned} \text{Min } Z &= 6x_1 + 2x_2 + 10x_3 \\ 9x_1 + 6x_3 &\geq 6 \\ x_1 + x_2 + x_3 &= 16 \\ 4x_1 + 8x_2 &\leq 12 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

8/

$$\begin{aligned} \text{Min } Z &= 6x_1 + 20x_2 \\ 5x_1 + 6x_2 &\geq 10 \\ 2x_1 + 7x_2 &\geq 14 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

9/

$$\begin{aligned} \text{Max } Z &= 10x_1 + 25x_2 \\ x_1 &\leq 200 \\ x_1 &\leq 150 \\ x_1 + x_2 &= 300 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

10/

$$\begin{aligned} \text{Max } Z &= 3x_1 - 2x_2 + x_3 \\ -10x_1 + 30x_3 &\geq 10 \\ 3x_1 + 4x_2 + 2x_3 &\leq 6 \\ 10x_1 + 20x_2 - 10x_3 &\leq 20 \\ x_1, x_2, x_3 &\geq 0 \end{aligned}$$

