

Use graphical method to solve the following problem:

Maximize subject to

$$\begin{aligned} Z &= 5x_1 + 3x_2, \\ x_1 + x_2 &\leq 6, \\ 0 \leq x_1 &\leq 3, \\ 0 \leq x_2 &\leq 3, \\ 2x_1 + 3x_2 &\geq 3 \end{aligned}$$

Minimize subject to

$$\begin{aligned} Z &= 20x_1 + 10x_2, \\ x_1 + 2x_2 &\leq 40, \\ 3x_1 + x_2 &\geq 30, \\ 4x_1 + 3x_2 &\geq 60, \\ x_1, x_2 &\geq 0 \end{aligned}$$

Minimize subject to

$$\begin{aligned} Z &= 3x_1 + 2x_2, \\ 8x_1 + x_2 &\geq 8, \\ 2x_1 + x_2 &\geq 6, \\ x_1 + 3x_2 &\geq 6, \\ x_1 + 6x_2 &\geq 8, \\ x_1, x_2 &\geq 0 \end{aligned}$$

Maximize subject to

$$\begin{aligned} Z &= -150x_1 - 100x_2 + 280000, \\ 20 \leq x_1 &\leq 60, \\ 70 \leq x_2 &\leq 140, \\ 120 \leq x_1 + x_2 &\leq 140, \\ x_1, x_2 &\geq 0 \end{aligned}$$

Q15.