

Oppgave 2

11 September 2024

13:48

a)

$$\min z = 4x_1 + 8x_2 + 3x_3$$

$$\begin{aligned} \text{Var} \quad & x_1 + x_2 \geq 2 \\ & 2x_2 + x_3 \geq 5 \\ & x_1, x_2, x_3 \geq 0 \end{aligned}$$

Blin til

$$z = 4x_1 + 8x_2 + 3x_3 + Ma_1 + Ma_2 \quad (0)$$

$$\begin{aligned} x_1 + x_2 + s_1 + a_1 &= 2 \\ 2x_2 + x_3 + s_2 + a_2 &= 5 \end{aligned} \quad \begin{matrix} (1) \\ (2) \end{matrix}$$

b)

Basis-variable	Eqn	$z \ x_1 \ x_2 \ x_3 \ s_1 \ s_2 \ a_1 \ a_2$	RHS	Forholdstest
z	(0)	$1 \ M \ -4 \ M \ -3 \ -M \ -M \ 0 \ 0$	$z \ M$	
a_1	(1)	$0 \ 1 \ 1 \ 0 \ -1 \ 0 \ 1 \ 0$	2	2
a_2	(2)	$0 \ 0 \ 2 \ 1 \ 0 \ -1 \ 0 \ 1$	5	2.5
z	(0)	$1 \ -2M \ 0 \ M \ -3M \ -M \ -M \ 0 \ 0$	$M + 16$	
x_2	(1)	$0 \ 1 \ 1 \ 0 \ -1 \ 0 \ 1 \ 0$	2	-2
a_2	(2)	$0 \ -2 \ 0 \ 1 \ 2 \ -1 \ -2 \ 1$	1	0.5
z	(0)	$1 \ -4 \ 0 \ 1 \ 0 \ -4M \ -M \ 0$	20	
x_2	(1)	$0 \ 0 \ 1 \ 1/2 \ 0 \ -1/2 \ 0 \ 1/2$	2.5	6
s_1	(2)	$0 \ -1 \ 0 \ 1/2 \ 1 \ -1/2 \ -1 \ 1/2$	0.5	1
z	(0)	$1 \ -2 \ 0 \ 0 \ -2 \ -3M \ -M \ 0$	19	
x_2	(1)	$0 \ 1 \ 1 \ 0 \ -1 \ 0 \ 1 \ 0$	2	
x_3	(2)	$0 \ -2 \ 0 \ 1 \ 2 \ -1 \ -2 \ 1$	1	

$$z = 19$$

$$(x_1, x_2, x_3) = (0, 2, 1)$$