

$$\min \quad 5x_1 + x_2 - \frac{1}{2}x_3 \quad \rightarrow \quad \max \quad -5x_1 - x_2 + \frac{1}{2}x_3$$

$$\max \quad Z = -5x_1 - x_2 + \frac{1}{2}x_3 - M y_1 - M y_2$$

$$\text{s.t.:} \quad x_1 + 5x_2 - 2x_3 + y_1 = 15$$

$$x_1 - x_2 + x_3 + y_2 = 3$$

$$x_1, x_2, x_3, y_1, y_2 \geq 0$$

$$Z + 5x_1 + x_2 - \frac{1}{2}x_3 + M y_1 + M y_2 = 0$$

1	5	1	$-\frac{1}{2}$	M	M	0
0	1	5	-2	1	0	15
0	1	-1	1	0	1	3

$$R_0 := R_0 - M R_1$$

1	5-M	1-5M	$-\frac{1}{2}+2M$	0	M	-15M
0	1	5	-2	1	0	15
0	1	-1	1	0	1	3

$$R_0 := R_0 - M R_2$$

z	x_1	x_2	x_3	y_1	y_2	
1	5-2M	1-4M	$-\frac{1}{2}+M$	0	0	-18M
y_1 0	1	5	-2	1	0	15 $\frac{15}{1} = 15$
y_2 0	1	-1	1	0	1	3 $\frac{3}{1} = 3$

$$R_0 := R_0 - (5-2M) R_2$$

$$R_1 := R_1 - R_2$$

1	0	5-6M	$-\frac{11}{2}+3M$	0	-5+2M	-15-12M
y_1 0	0	6	-3	1	-1	12 $\frac{12}{6} = 2$
x_1 0	1	-1	1	0	1	3

$$R_1 := \frac{1}{6} R_1$$

1	0	$6-6M$	$-\frac{M}{2}+3M$	0	$-5+2M$	$-15-12M$
0	0	(1)	$-\frac{1}{2}$	$\frac{1}{6}$	$-\frac{1}{6}$	2
0	1	-1	1	0	1	3

$$R_0 := R_0 - (6-6M)R_1$$

$$R_2 := R_2 + R_1$$

1	0	0	$-\frac{5}{2}$	$-1+M$	$-4+M$	-27
x_2 0	0	1	$-\frac{1}{2}$	$\frac{1}{6}$	$-\frac{1}{6}$	2
x_1 0	1	0	$\frac{1}{2}$	$\frac{1}{6}$	$\frac{5}{6}$	5

$\frac{5}{\frac{1}{2}} = 10$

$$R_2 := 2R_2$$

1	0	0	$-\frac{5}{2}$	$-1+M$	$-4+M$	-27
0	0	1	$-\frac{1}{2}$	$\frac{1}{6}$	$-\frac{1}{6}$	2
0	2	0	(1)	$\frac{1}{3}$	$\frac{5}{3}$	10

$$R_0 := R_0 + \frac{5}{2}R_2$$

$$R_1 := R_1 + \frac{1}{2}R_2$$

	1	5	0	0	$-\frac{1}{6} + M$	$\frac{1}{6} + M$	-2
x_2 0		1	1	0	$\frac{1}{3}$	$\frac{2}{3}$	7
x_3 0		2	0	1	$\frac{1}{3}$	$\frac{5}{3}$	10