Example. Maximize

$$z = 3x_1 + x_2$$

subject to:

$$\begin{aligned} -x_1 + x_2 &\leq 1 \\ x_1 &\leq 3 \\ 2x_1 + x_2 &\leq 7 \\ x_1,\ x_2 &\geq 0 \end{aligned}$$

Simplex tableau

x_1	x_2	s_1	s_2	s_3	
-1	1	1	0	0	1
1	0	0	1	0	3
2	1	0	0	1	7
3	1	0	0	0	z

x_1	x_2	s_1	s_2	s_3	
-1	1	1	0	0	1
1	0	0	1	0	3
3	0	-1	0	1	6
4	0	-1	0	0	$z-1$

x_1	x_2	s_1	s_2	s_3	
0	1	$\frac{2}{3}$	0	$\frac{1}{3}$	3
0	0	$\frac{1}{3}$	1	$-\frac{1}{3}$	1
1	0	$-\frac{1}{3}$	0	$\frac{1}{3}$	2
0	0	$\frac{1}{3}$	0	$-\frac{4}{3}$	$z-9$

Geometric interpretation of the simplex method

Recall: Maximize

$$z = 3x_1 + x_2$$

subject to:

$$\begin{aligned} -x_1 + x_2 &\leq 1 \\ x_1 &\leq 3 \\ 2x_1 + x_2 &\leq 7 \\ x_1,\ x_2 &\geq 0 \end{aligned}$$