Example: (Dual Simplex Method)

Min z = $2x_1 + x_2$
s.t. $3x_1 + x_2 \geq 3$
             $4x_1 + 3x_2 \geq 6$
             $x_1 + 2x_2 \leq 3$
             $x_i \geq 0$

$\Leftrightarrow$ Min z = $2x_1 + x_2$
s.t. $-3x_1 - x_2 \leq -3$
             $-4x_1 - 3x_2 \leq -6$
             $x_1 + 2x_2 \leq 3$
             $x_i \geq 0$

$\Leftrightarrow$ Min z = $2x_1 + x_2$
s.t. $-3x_1 - x_2 + S_1 = -3$
             $-4x_1 - 3x_2 + S_2 = -6$
             $x_1 + 2x_2 + S_3 = 3$
             $x_i \geq 0$

	x_1	x_2	S_1	S_2	S_3	RHS
Z	-2	-1	0	0	0	0
S_1	-3	-1	1	0	0	−3
S_2	-4	(-3)	0	1	0	−6
S_3	1	2	0	0	1	3
Ratio	1/2	1/3	-	-	-	-

	x_1	x_2	S_1	S_2	S_3	RHS
Z	-2/3	0	0	-1/3	0	2
S_1	(-5/3)	0	1	-1/3	0	-1
x_2	4/3	1	0	-1/3	0	2
S_3	-5/3	0	0	2/3	1	-1
Ratio	2/5	-	-	1	-	-

	x_1	x_2	S_1	S_2	S_3	RHS
Z	0	0	-2/5	-1/5	0	12/5
x_1	1	0	-3/5	1/5	0	3/5
x_2	0	1	4/5	-3/5	0	6/5
S_3	0	0	-1	1	1	0

Then, $x^*_1 = \dfrac{3}{5}$, $x^*_2 = \dfrac{6}{5}$, and $Z^* = \dfrac{12}{5}$.

Graphically:

$$\left(\frac{3}{5}, \frac{6}{5}\right)$$

Dual Simplex Path

3

2
3
2
1

1 3
   2 2 3