Оптимизация дз 1

$L = 2x_1 + 3x_2 - x_4 \to \max$

$$\begin{cases} 3x_1 + 2x_2 + x_3 - 3x_4 = 18 \\ 2x_1 - x_2 - 2x_4 + x_5 = 16 \\ -x_1 + 3x_2 + 4x_4 + x_6 = 24 \\ x_1, \dots, x_6 \geq 0 \end{cases}$$

Базис	x_1	x_2	x_3	x_4	x_5	x_6	free	Θ
x_3	3	2	1	-3	0	0	18	9
x_5	2	-1	0	-2	1	0	16	—
x_6	-1	3	0	4	0	1	24	8
	-2	-3	0	1	0	0		

Опорный план
$x^{(0)} = (0, 0, 18, 0, 16, 24)$

Базис	x_1	x_2	x_3	x_4	x_5	x_6	free	Θ
x_3	$11/3$	0	1	$-17/5$	0	$-2/5$	2	$6/11$
x_5	$5/3$	0	0	$-2/3$	1	$1/3$	24	$72/5$
x_2	$-1/3$	1	0	$4/3$	0	$1/3$	8	—
	-3	0	0	5	0	1		

Опорный план
$x^{(1)} = (0, 8, 2, 0, 24, 0)$

Базис	x_1	x_2	x_3	x_4	x_5	x_6	free	Θ
x_1	1	0	$3/11$	$-17/11$	0	$-2/11$	$6/11$	
x_5	0	0	$-5/11$	$21/11$	1	$7/11$	$254/11$	
x_2	0	1	$1/11$	$9/11$	0	$3/11$	$90/11$	
	0	0	$9/11$	$4/11$	0	$5/11$		

Опорный план
$x^{(2)} = (6/11, \frac{90}{11}, 0, 0, \frac{254}{11}, 0)$

$L = 2 \cdot \frac{6}{11} + 3 \cdot \frac{90}{11} \approx 25,(63)$

In [ ]:
```
import numpy as np
from scipy.optimize import linprog
```

In [ ]:
```
c = np.array([-2, -3, 1, 0, 0, 0, 0])
A = np.array([
    [2, -1, -2, 1, 0, 0, 0],
    [3, 2, -3, 0, 1, 0, 0],
    [-1, 3, 4, 0, 0, 1, 0]
])
b = np.array([16, 18, 24])

res = linprog(c, A_eq=A, b_eq=b)
```

In [ ]:
```
res.fun
```

Out[ ]:
```
-25.636363636363637
```