

Решение задачи ЛО графическим методом

$$-x_1 - 3x_2 \geq -15$$

$$2x_1 + x_2 \leq 17$$

$$-2x_1 - 3x_2 \geq -23$$

$$x_1 \geq 0, x_2 \geq 0$$

$$f = -40x_1 - 30x_2 \rightarrow \min$$

Решение

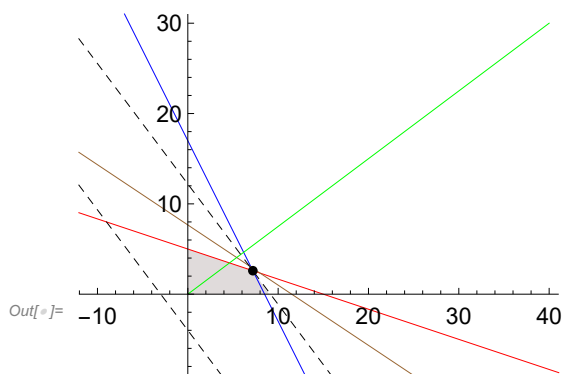
$$\begin{aligned} -x_1 - 3x_2 = -15 & \quad 1) \quad] x_1 = 0, x_2 = 5;] x_2 = 0, x_1 = 15; \\ 2x_1 + x_2 = 17 & \quad \Rightarrow 2) \quad] x_1 = 0, x_2 = 17;] x_2 = 0, x_1 = 8.5; \\ -2x_1 - 3x_2 = -23 & \quad 3) \quad] x_1 = 0, x_2 = \frac{23}{3};] x_2 = 0, x_1 = 11.5; \end{aligned}$$

Grad f:

x_1	x_2
0	0
-40	-30

] f = 120:

x_1	x_2
0	-4
-3	0



Градиент $-f$: ■

1) $\{0; 5\}, \{15; 0\}$: ■

2) $\{0; 17\}, \{8.5; 0\}$: ■

3) $\{0; \frac{23}{3}\}, \{11.5; 0\}$: ■

$f = 120$: - - - -

$$2 \cap 1: \begin{aligned} -x_1 - 3x_2 = -15 & \Rightarrow -x_1 - 51 + 6x_1 = -15 & \Rightarrow x_1 = \frac{36}{5}; \\ 2x_1 + x_2 = 17 & \Rightarrow x_2 = 17 - 2x_1 & \Rightarrow x_2 = \frac{13}{5}; \end{aligned}$$

$$f = -40 \cdot \frac{36}{5} - 30 \cdot \frac{13}{5} = -366$$