

20.09.25

Вариант 17

$$z = 2x_1 + 3x_2 \rightarrow \max$$

$$a) \begin{cases} x_1 + 2x_2 \leq 8, \\ 3x_1 + x_2 \leq 6, \\ 2x_1 + x_2 \geq 3, \\ x_1, x_2 \geq 0. \end{cases}$$

$$x_1 + 2x_2 = 8$$

$$\text{При } x_1 = 0 : x_2 = 4$$

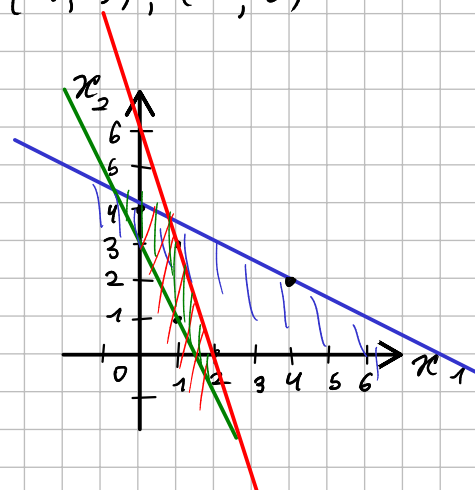
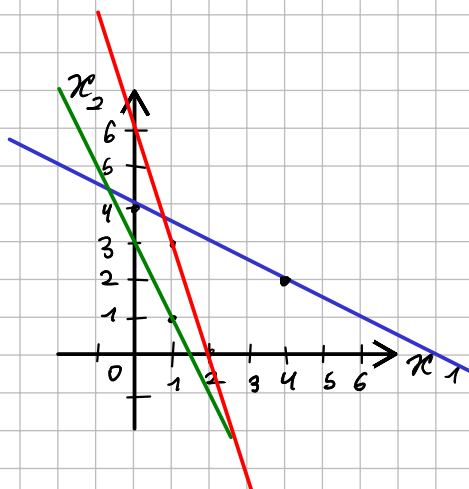
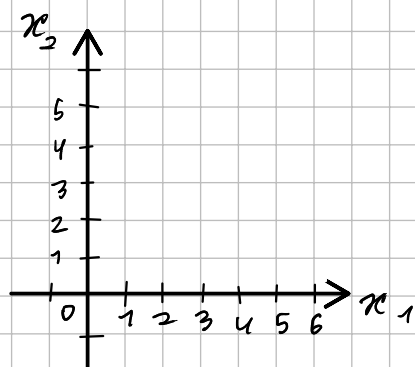
$$\text{При } x_2 = 2 : x_1 = 4$$

$$2x_1 + x_2 = 3$$

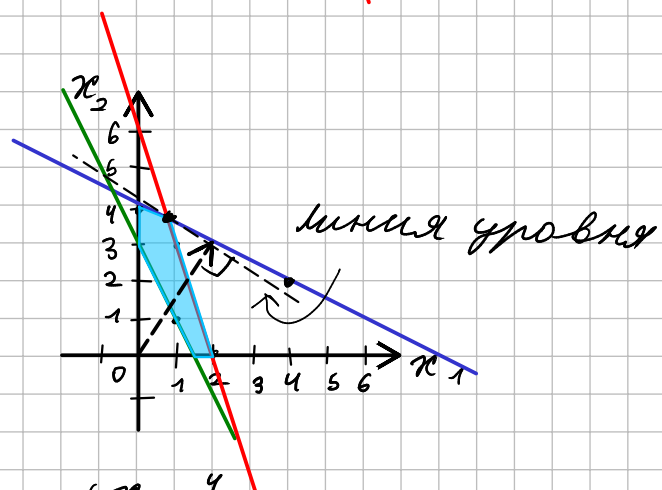
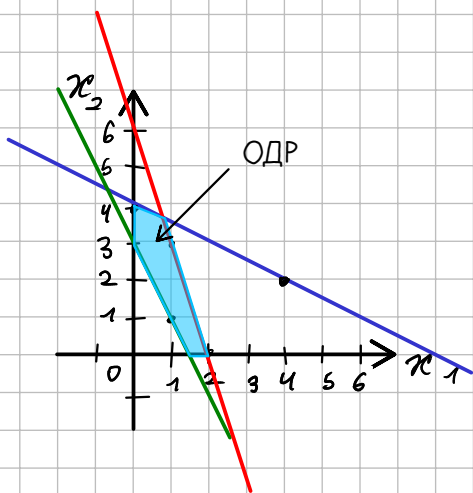
$$(0; 3), (1; 1)$$

$$3x_1 + x_2 = 6$$

$$(1; 3), (2; 0)$$



$$\vec{N} = (2; 3)$$



$$\begin{cases} x_1 + 2x_2 = 8 \\ 3x_1 + x_2 = 6 \end{cases} \cdot (-2)^+ \Rightarrow \begin{cases} x_1 + 2x_2 = 8 \\ -5x_1 = -4 \end{cases} \Rightarrow \begin{cases} x_1 = \frac{4}{5} \\ x_2 = \frac{8 - \frac{4}{5}}{2} = 4 - \frac{2}{5} = \frac{18}{5} = 3\frac{3}{5} \end{cases}$$

$$\text{Ответ: } \left(\frac{4}{5}; 3\frac{3}{5}\right)$$

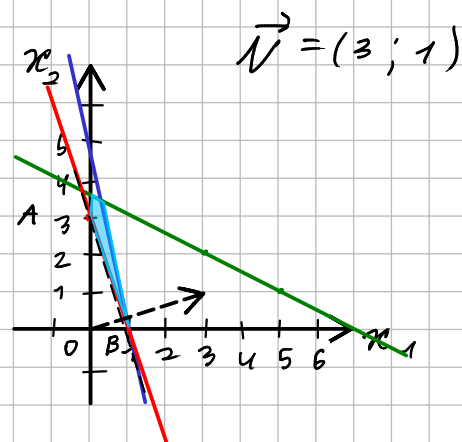
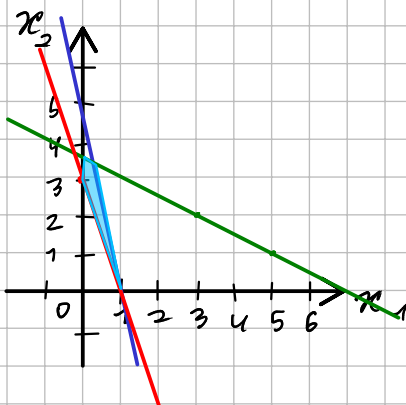
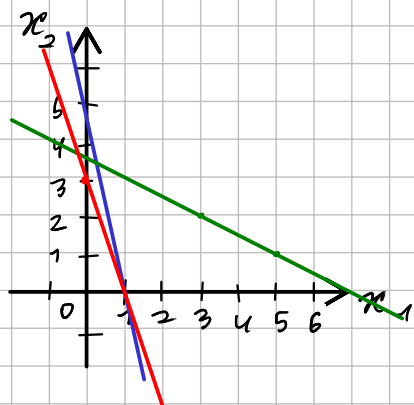
$$z = 9x_1 + 3x_2 \rightarrow \min$$

$$6) \begin{cases} 9x_1 + 2x_2 \leq 9, \\ x_1 + 2x_2 \leq 7, \\ 3x_1 + x_2 \geq 3, \\ x_1, x_2 \geq 0. \end{cases}$$

$$9x_1 + 2x_2 = 9 \Rightarrow (1; 0), (0; 4,5)$$

$$x_1 + 2x_2 = 7 \Rightarrow (5; 1), (3; 2)$$

$$3x_1 + x_2 = 3 \Rightarrow (1; 0), (0; 3)$$



$$A = (0; 3), B = (1; 0)$$

$$F(A) = 9$$

$$F(B) = 9$$

$\Rightarrow F \rightarrow \min$ на отрезке AB

Ответ: $F \rightarrow \min$ на отрезке AB

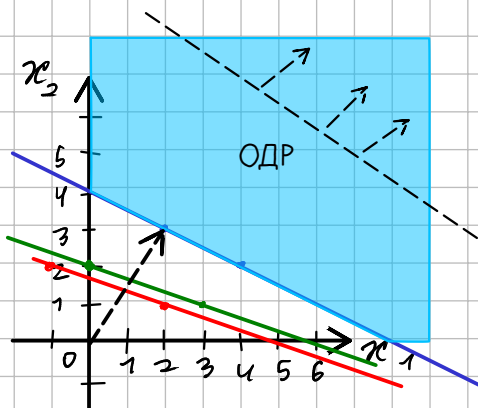
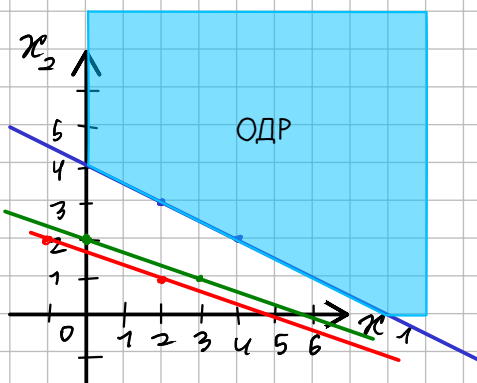
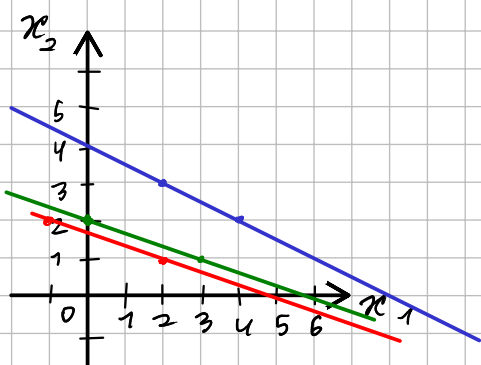
$$z = 2x_1 + 3x_2 \rightarrow \max$$

$$B) \begin{cases} x_1 + 2x_2 \geq 8, \\ x_1 + 3x_2 \geq 6, \\ x_1 + 3x_2 \geq 5, \\ x_1, x_2 \geq 0. \end{cases}$$

$$x_1 + 2x_2 = 8 \Rightarrow (4; 2), (2; 3)$$

$$x_1 + 3x_2 = 6 \Rightarrow (3; 1), (0; 2)$$

$$x_1 + 3x_2 = 5 \Rightarrow (2; 1), (-1; 2)$$



$F \rightarrow \max$, но ОДР не ограничена сверху \Rightarrow
 $\Rightarrow F_{\max} = +\infty$

Ответ: $(x_1, x_2) - ?$ $F_{\max} = +\infty$

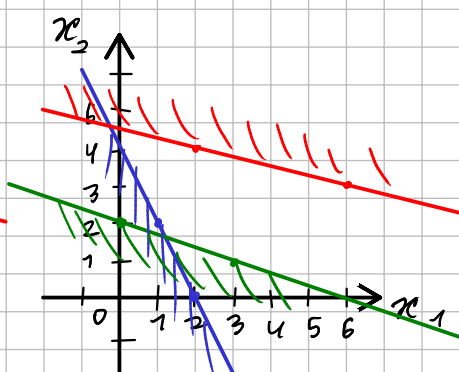
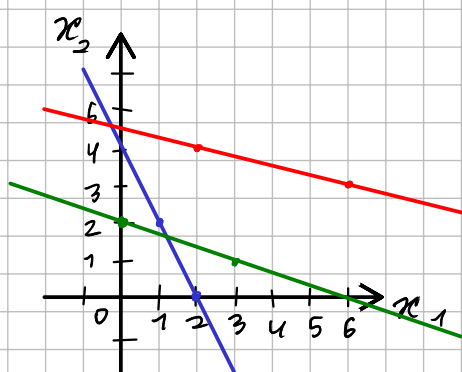
$$z = 4x_1 + 3x_2 \rightarrow \min$$

$$Г) \begin{cases} 4x_1 + 2x_2 \leq 8, \\ x_1 + 3x_2 \leq 6, \\ x_1 + 4x_2 \geq 18, \\ x_1, x_2 \geq 0. \end{cases}$$

$$4x_1 + 2x_2 = 8 \Rightarrow (1; 2), (2; 0)$$

$$x_1 + 3x_2 = 6 \Rightarrow (3; 1), (0; 2)$$

$$x_1 + 4x_2 = 18 \Rightarrow (2; 4), (6; 3)$$



$ОДР = \emptyset \Rightarrow$
 \Rightarrow нет решений.

Ответ: нет реш.