Зад 1.

$$f(x_1, x_2) = (x_1 \overline{x_2} + x_2)(x_1 + \overline{x_2}) =$$

$$= x_1 \overline{x_2} x_1 + x_1 \overline{x_2}\,\overline{x_2} + x_1 x_2 + 0 =$$

$$= x_1 x_2 + x_1 x_2 + x_1 x_2 + 0 =$$

$$x_1 \overline{x_2} + x_1 x_2 = x_1(\overline{x_2} + x_2) = x_1$$

$$\overline{x_2 x_2} = \overline{0} \cdot \overline{1} = 0 \cdot 0 = 0 \qquad \overline{0} = 1$$

$$\overline{0} \cdot \overline{0} = 1 \cdot 1 = 1$$

Зад 2

$$f(x_0, x_1 x_2) = \overline{x_1 \cdot \overline{x_0} + x_2} + x_0 \cdot \overline{x_2} =$$

$$= \overline{x_1} \cdot \overline{\overline{x_0}} \cdot \overline{x_2} + x_0 \cdot \overline{x_2} =$$

$$= \left(\overline{x_1} + x_0\right) \cdot \overline{x_2} + x_0 \cdot \overline{x_2} =$$

$$= \overline{x_1} \cdot \overline{x_2} + x_0 \overline{x_2} + x_0 + x_2 =$$

$$= \overline{x_1}\,\overline{x_2} + x_0 \overline{x_2}$$

Зад 3

$$f(A, B, C, D) = \overline{A + B + \overline{C} + D} + \overline{\overline{A} \cdot B + \overline{C} + D} =$$

$$= \overline{A} \cdot \overline{B} \cdot C \cdot \overline{D} + \left(\overline{\overline{A} \cdot B} \cdot \left(\overline{\overline{C + D}}\right)\right) =$$

$$= \overline{A}\,\overline{B} \cdot C \cdot \overline{D} + \left(A + \overline{B}\right)\left(\overline{C} + D\right)$$