2) Линейное преобразование

$x' = a_{11}x + a_{12}y + a_{13}$

$y' = a_{21}x + a_{22}y + a_{23}$

ортогональное если

$a_{11}^2 + a_{21}^2 = 1, \quad a_{12}^2 + a_{22}^2 = 1, \quad a_{11}\cdot a_{12} + a_{21}\cdot a_{22} = 0$

Точки $A_1(x_1, y_1)$ и $A_2(x_2, y_2) \Rightarrow A_1'(x_1', y_1')$ $A_2(x_2' - y_2')$

$[A_1'A_2'] = (x_2' - x_1')^2 + (y_2' - y_1')^2 = [a_{11}(x_2 - x_1) + a_{12}(y_2 - y_1)]^2 +$

$+ [a_{21}(x_2 - x_1) + a_{22}(y_2 - y_1)]^2 = (a_{11}^2 + a_{21}^2)(x_2 - x_1)^2 + (a_{12}^2 + a_{22}^2)(y_2^2 - y_1^2)$

$+ 2(a_{11}a_{12} + a_{21}a_{12})(x_2 - x_1)(y_2 - y_1) = (x_2 - x_1)^2 + (y_2 - y_1)^2 = |A_1A_2|^2$

4) $Ax + By + Cz + D = 0$ $D = 0$

$Ax + By + Cz = 0$

4.2) $A_1x + B_1y + C_1z + D_1 = 0$

пряма

$$\frac{x - x_1}{x_2 - x_1} = \frac{y - y_1}{y_2 - y_1} = \frac{z - z_1}{z_2 - z_1}$$

$$\begin{cases} A_1(x_2 - x_1) + B_1(y_2 - y_1) + C_1(z_2 - z_1) \\ A_1 x_1 + B_1 y_1 + C_1 z_1 + D_1 = 0 \end{cases}$$