Geometry 1e – Practice

9th class – 11.11.2025.

1. Determine the equation of the plane in the space through $P_0(x_0, y_0, z_0)$, orthogonal the direction of $\mathbf{n}(n_x, n_y, n_z)$.
2. Give the equation of the plane α, if
   a. $P(3,2,-1)$ lies on it, and it is parallel to the xy, xz, yz coordinate plane,
   b. the xy, xz, yz coordinate plane,
   c. $P(2,3,5)$ and $Q(-1,4,3)$ lie on it and it is orthogonal to the xy coordinate plane,
   d. $A(3,-1,2), B(4,-1,-1)$ and $C(2,0,2)$ lie on it,
   e. $O(0,0,0)$ lies on it and parallel to $\frac{x-3}{2} = y + 7 = z$,
   f. it intersects the x, y, z coordinate axis in $4, -3, 2$, respectively,
   g. $R(-1,5,7)$ lies on it at is is parallel to the lines $e: x = 5 - 2t, y = t, z = -1 + 3t$ and $f: x = 7 + 9t, y = 3, z = -t$,
   h. it is the perpendicular bisector of points $A(-3,7,6)$and $B(1,-5,0)$,
   i. it is the angular bisector of planes $x - 3y + 2z = 5$ and $3x - 2y - z + 3 = 0$.
3. Determine the distance of a point P(x,y,z) to the plane α, that is passing through $P_0(x_0, y_0, z_0)$ with normal $\mathbf{n}(n_x, n_y, n_z)$.
4. Determine the distance of
   a. $P(-2,-4,3)$ to $2x - y + 2z + 3 = 0$,
   b. $Q(1,2,-3)$ to $5x - 3y + z - 1 = 0$,
   c. $-x - \sqrt{2}y + z - 1 = 0$ and $x + \sqrt{2}y - 7 + 3 = 0$.
5. Give the angle of $x + 2y + 6z - 12 = 0$ and $6x + 3y - 2z = 0$.