Geometry 1e – Practice

3rd class – 30.09.2025.

1. Give the equation of the line, given by:
   a. a point $P(x_0, y_0)$ and a direction vector $\underline{v}(v_x, v_y)$.
   b. a point $P(x_0, y_0)$ and an orthogonal vector $\underline{n}(n_x, n_y)$.
   c. two points $A(x_0, 0)$ and $B(0, y_0)$.
   d. two points $A(x_1, y_1)$ and $B(x_2, y_2)$.
2. In ABC_Δ, $A(-2, -1), B(6, -3)$ and $C(2,5)$. Determine the equation of the
   a. sides
   b. medians
   c. altitudes
   d. perpendiculat bisectors.
3. What is the minimal area of the triangles, formed by the coordinate axis and a line, through $P(2,4)$?
4. Prove that the midpoints of the quadrilateral $A(-6,4), B(4,2), C(3, -3)$ and $D(-6,0)$ form a parallelogram.
5. Determine the coordinates of C in ABC_Δ, if $A(-5, -2), B(3,1)$ and its centroid is $S\left(-\frac{4}{3}, 2\right)$.
6. Determine the equation of sides in ABC_Δ, if $A\left(\frac{13}{2}, -2\right)$ and $y - x = 4, 7x + 2y = 7$ are altitudes.
7. Prove that the intersections of the medians, altitudes and perpendicular bisectors are colinear in Ex. 2.