

Geometry 1e – Practice

8th class – 4.11.2025.

1. Determine the equation of the line in the space through $P_0(x_0, y_0, z_0)$ in the direction of $\mathbf{v}(v_x, v_y, v_z)$. /Parametric and equation system form/
2. Give the equation of the line l , if
 - a. $A(-2, 5, 6)$ and $B(7, -1, 3)$ lies on it,
 - b. $P(3, -1, 5)$ lies on it and it is parallel to the y axis,
 - c. $P(-3, 7, 5)$ lies on it and it is parallel to the xy coordinate plane,
 - d. $P(3, -1, 2)$ lies on it and parallel to $\frac{x-8}{2} = \frac{y}{3} = \frac{z+9}{7}$.
3. Determine the mutual position of the lines:
 - a. $\frac{x+2}{3} = \frac{y-1}{-2} = z$ and $x = 5 + 6t, y = -4, z = 7 + 2t$,
 - b. $x = 2t, y = 13 + 5t, z = -13 - 7t$ and $x = 2t - 2, y = 2 - t, z = 4 + 3t$,
 - c. $x = t, y = -1 + 2t, z = 1 + t$ and $x = 5 + 25, y = -t, z = 3 - 2t$.
4. Determine the value of a , if lines $\frac{x+2}{2} = -\frac{y}{3} = \frac{z-1}{4}$ and $\frac{x-3}{a} = \frac{y-1}{4} = \frac{z-7}{2}$ are intersecting.
5. Evaluate the angle of lines $x - 3 = -y - 2 = \frac{z}{\sqrt{2}}$ and $x + 2 = y - 3 = \frac{z+5}{\sqrt{2}}$.
6. Give the distance of $P(2, 4, -6)$ to the line $\frac{x-2}{6} = \frac{y+1}{9} = \frac{z}{2}$.
7. Prove that $x = 2 + 3t, y = -1 + 4t, z = 2t$ and $x = 7 + 3t, y = 1 + 4t, z = 3 + 2t$ are parallel lines. What is their distance?
8. Reflect $P(-1, 2, 3)$ in $\frac{x+1}{3} = y = z$.
9. Give the equation of the line l , if its projection to xy is $x - 2y = 15$ and to yz is $3y - z = 10$.
10. Determine the distance and angle of $\frac{x+2}{4} = -\frac{y+1}{3} = \frac{2z-14}{18}$ and the z axis.