Tasks. A straight line and a plane in a space

1. Form an equation of a plane passing through the point $M(3,-2,-7)$ and parallel to the plane $2x-3z+5=0$.

2. Form an equation of a plane passing through the point $M(3,-1,2)$ and perpendicular to two given planes $3x+y-z+2=0$ and $x+4z+1=0$.

3. Form an equation of a plane perpendicular to the plane $2x-2y+4z-5=0$ and cut on the coordinate axes OX and OY two segments $a=-2$ and $b=2/3$.

4. Find the distance between the following parallel planes $x-2y+3z+7=0$ and $x-2y+3z-1=0$.

5. Write down canonical equations of the straight line $\begin{cases} x-y+3z-1=0 \\ 2x+y+z-2=0 \end{cases}$.

6. Form an equation of a straight line passing through the point $M(3,-2,-7)$ and perpendicular to the plane $2x-3z+5=0$.

7. The apexes $A(2,3,4)$, $B(4,7,3)$, $C(1,2,2)$ and $D(-2,0,1)$ are given. Find: 1) the straight line and the length of its edge AB; 2) an angle between the straight lines AB and CD; 3) an equation of the plane ABC; 4) an equation of the altitude dropped from the apex D on the plane ABC; 5) an angle between the straight line AD and the plane ABC.

8. At which value of m the straight line $\frac{x+1}{3}=\frac{y-2}{m}=\frac{z+3}{-2}$ is parallel to the plane $x-3y+6z+7=0$?

9. Find at what values of λ and μ the couple of equations will define parallel planes $\begin{matrix} (1)\ 2x+\lambda y+3z-5=0 \\ (2)\ \mu x-6y-6z+2=0 \end{matrix}$.

10. Find at what value of λ the couple of equations will define perpendicular planes $(1)\ 5x + y - 3z + 3 = 0 \quad (2)\ 2x + \lambda y - 3z = 0$.