Раздел: Аналитическая геометрия и векторная алгебра

I. Найти угол между диагоналями параллелограмма, построенного на векторах $\bar{a}$ и $\bar{b}$.

1.	$\bar{a}(1, 2, 1)$, $\bar{b}(1, -1, 2)$.
2.	$\bar{a}(3, 0, 1)$, $\bar{b}(1, -1, 1)$.
3.	$\bar{a}(2, 1, -1)$, $\bar{b}(1, 3, 1)$.
4.	$\bar{a}(2, 1, 5)$, $\bar{b}(1, -3, 2)$.
5.	$\bar{a}(1, 2, 2)$, $\bar{b}(3, -1, 0)$.
6.	$\bar{a}(1, 2, 0)$, $\bar{b}(0, 1, 3)$.
7.	$\bar{a}(1, 1, -1)$, $\bar{b}(1, -1, 1)$.
8.	$\bar{a}(2, 1, 0)$, $\bar{b}(1, -1, 2)$.
9.	$\bar{a}(0, 1, 0)$, $\bar{b}(1, 0, 1)$.
10.	$\bar{a}(3, 0, 1)$, $\bar{b}(1, 3, 0)$.
11.	$\bar{a}(2, -1, 1)$, $\bar{b}(1, 3, 1)$.
12.	$\bar{a}(0, 1, 1)$, $\bar{b}(1, 0, 1)$.
13.	$\bar{a}(1, 2, 1)$, $\bar{b}(3, 0, 1)$.
14.	$\bar{a}(2, 1, 1)$, $\bar{b}(3, 0, 1)$.
15.	$\bar{a}(2, 1, -1)$, $\bar{b}(1, 3, -1)$.
16.	$\bar{a}(2, -1, 1)$, $\bar{b}(2, 0, 4)$.
17.	$\bar{a}(1, 3, 2)$, $\bar{b}(1, 2, 2)$.
18.	$\bar{a}(2, 1, -1)$, $\bar{b}(1, 2, 1)$.
19.	$\bar{a}(3, 1, 1)$, $\bar{b}(2, 1, 2)$.
20.	$\bar{a}(3, 2, 1)$, $\bar{b}(2, 3, 1)$.
21.	$\bar{a}(4, 1, 3)$, $\bar{b}(2, 1, 2)$.
22.	$\bar{a}(5, 1, 0)$, $\bar{b}(0, 2, 1)$.
23.	$\bar{a}(2, 3, -1)$, $\bar{b}(1, -1, 1)$.
24.	$\bar{a}(3, 1, 2)$, $\bar{b}(1, 2, 3)$.
25.	$\bar{a}(1, -1, 1)$, $\bar{b}(2, 1, -2)$.
26.	$\bar{a}(3, 1, -4)$, $\bar{b}(-8, 1, -2)$.
27.	$\bar{a}(4, -10, 1)$, $\bar{b}(7, 2, -8)$.
28.	$\bar{a}(1, 2, 2)$, $\bar{b}(5, 1, 0)$.
29.	$\bar{a}(2, 1, 2)$, $\bar{b}(3, 1, 1)$.
30.	$\bar{a}(1, 3, 1)$, $\bar{b}(2, -1, 1)$.

II. Установить: являются ли векторы $\bar{a}$, $\bar{b}$, $\bar{c}$ компланарными.

1.	$\bar{a}(1, -1, 1)$, $\bar{b}(3, 2, 1)$, $\bar{c}(1, 3, 2)$.
2.	$\bar{a}(2, 0, -1)$, $\bar{b}(3, 2, 1)$, $\bar{c}(1, -1, 0)$.
3.	$\bar{a}(1, -1, 1)$, $\bar{b}(2, 1, -1)$, $\bar{c}(1, -4, 4)$.
4.	$\bar{a}(2, 1, 3)$, $\bar{b}(1, 4, 2)$, $\bar{c}(0, -7, -1)$.
5.	$\bar{a}(1, 3, -1)$, $\bar{b}(2, -1, 0)$, $\bar{c}(3, 2, 1)$.
6.	$\bar{a}(2, -1, 1)$, $\bar{b}(1, 3, -1)$, $\bar{c}(2, 0, 1)$.
7.	$\bar{a}(1, 0, 1)$, $\bar{b}(0, 0, 1)$, $\bar{c}(3, -2, 1)$.
8.	$\bar{a}(2, 3, -1)$, $\bar{b}(0, 2, -2)$, $\bar{c}(1, 4, -5)$.
9.	$\bar{a}(4, 3, 0)$, $\bar{b}(1, -2, 3)$, $\bar{c}(1, 3, 0)$.
10.	$\bar{a}(2, -1, 3)$, $\bar{b}(1, -2, 2)$, $\bar{c}(3, 0, 1)$.
11.	$\bar{a}(2, 3, -1)$, $\bar{b}(2, 1, -2)$, $\bar{c}(5, 3, 4)$.
12.	$\bar{a}(1, -3, 4)$, $\bar{b}(2, 5, 1)$, $\bar{c}(1, -14, 11)$.
13.	$\bar{a}(2, 1, 3)$, $\bar{b}(-1, 3, 2)$, $\bar{c}(1, -5, 2)$.
14.	$\bar{a}(0, 5, 3)$, $\bar{b}(3, 0, 1)$, $\bar{c}(2, 5, 1)$.
15.	$\bar{a}(1, 4, 2)$, $\bar{b}(-1, 3, 1)$, $\bar{c}(1, 4, 3)$.
16.	$\bar{a}(1, 5, 2)$, $\bar{b}(2, -1, 0)$, $\bar{c}(0, 3, 1)$.
17.	$\bar{a}(2, 5, 1)$, $\bar{b}(3, -2, 1)$, $\bar{c}(2, 4, 1)$.
18.	$\bar{a}(1, 3, 1)$, $\bar{b}(2, -1, 0)$, $\bar{c}(0, 1, 4)$.
19.	$\bar{a}(1, 2, -1)$, $\bar{b}(3, 2, 1)$, $\bar{c}(-7, -2, -5)$.
20.	$\bar{a}(2, 3, 4)$, $\bar{b}(0, 1, -2)$, $\bar{c}(-2, 4, 3)$.
21.	$\bar{a}(1, 5, -2)$, $\bar{b}(2, 3, 1)$, $\bar{c}(1, 3, 5)$.
22.	$\bar{a}(2, 0, 3)$, $\bar{b}(1, 1, 1)$, $\bar{c}(5, -1, 8)$.
23.	$\bar{a}(2, 5, 1)$, $\bar{b}(1, 4, 2)$, $\bar{c}(3, 1, 0)$.
24.	$\bar{a}(1, 0, -1)$, $\bar{b}(0, 1, -1)$, $\bar{c}(3, 1, 1)$.
25.	$\bar{a}(2, 5, 3)$, $\bar{b}(3, 1, 4)$, $\bar{c}(1, 9, 2)$.
26.	$\bar{a}(2, -3, 1)$, $\bar{b}(3, -1, 5)$, $\bar{c}(1, -4, 3)$.
27.	$\bar{a}(0, 2, -4)$, $\bar{b}(-1, -4, 5)$, $\bar{c}(3, 1, 7)$.
28.	$\bar{a}(2, -1, 3)$, $\bar{b}(4, -2, 5)$, $\bar{c}(2, 1, -1)$.
29.	$\bar{a}(1, 4, -5)$, $\bar{b}(2, 3, 0)$, $\bar{c}(3, 1, 7)$.
30.	$\bar{a}(2, 3, 1)$, $\bar{b}(-3, -1, -5)$, $\bar{c}(1, 5, -3)$.

III. Доказать, что векторы $\bar{e_1}$, $\bar{e_2}$, $\bar{e_3}$ образуют базис, написать разложение вектора $\bar{a}$ по базису $\bar{e_1}$, $\bar{e_2}$, $\bar{e_3}$.

1.	$\bar{a}(11, -6, 5)$, $\bar{e_1}(3, -2, 1)$, $\bar{e_2}(-1, 1, -2)$, $\bar{e_3}(2, 1, -3)$.
2.	$\bar{a}(2, 1, 0)$, $\bar{e_1}(1, -1, 2)$, $\bar{e_2}(2, 2, -1)$, $\bar{e_3}(3, 7, -7)$.
3.	$\bar{a}(1, -1, 2)$, $\bar{e_1}(2, 1, 0)$, $\bar{e_2}(2, 2, -1)$, $\bar{e_3}(3, 7, -7)$.
4.	$\bar{a}(2, 2, -1)$, $\bar{e_1}(2, 1, 0)$, $\bar{e_2}(1, -1, 2)$, $\bar{e_3}(3, 7, -7)$.
5.	$\bar{a}(3, 7, -7)$, $\bar{e_1}(2, 1, 0)$, $\bar{e_2}(1, -1, 2)$, $\bar{e_3}(2, 2, -1)$.
6.	$\bar{a}(1, 1, 1)$, $\bar{e_1}(1, 2, -3)$, $\bar{e_2}(1, -3, 2)$, $\bar{e_3}(-2, 0, 1)$.
7.	$\bar{a}(1, -2, 3)$, $\bar{e_1}(1, 1, 1)$, $\bar{e_2}(1, 1, -1)$, $\bar{e_3}(1, -1, 1)$.
8.	$\bar{a}(0, 5, -2)$, $\bar{e_1}(1, -2, 1)$, $\bar{e_2}(3, 2, 1)$, $\bar{e_3}(1, 0, -1)$.
9.	$\bar{a}(4, 3, 1)$, $\bar{e_1}(3, -2, 1)$, $\bar{e_2}(2, 1, 2)$, $\bar{e_3}(3, -1, -2)$.
10.	$\bar{a}(-2, -1, 1)$, $\bar{e_1}(1, -1, 3)$, $\bar{e_2}(-2, 2, 1)$, $\bar{e_3}(3, -2, 5)$.
11.	$\bar{a}(11, 11, 24)$, $\bar{e_1}(1, 1, 4)$, $\bar{e_2}(-1, 2, -3)$, $\bar{e_3}(2, -1, -3)$.
12.	$\bar{a}(4, -1, 11)$, $\bar{e_1}(1, 2, 3)$, $\bar{e_2}(-3, 1, -2)$, $\bar{e_3}(4, -3, 1)$.
13.	$\bar{a}(15, 15, 36)$, $\bar{e_1}(7, 5, 10)$, $\bar{e_2}(2, -3, -11)$, $\bar{e_3}(3, 2, 5)$.
14.	$\bar{a}(5, 16, 10)$, $\bar{e_1}(2, 1, 0)$, $\bar{e_2}(1, 0, 5)$, $\bar{e_3}(0, 3, -1)$.
15.	$\bar{a}(6, 16, 16)$, $\bar{e_1}(1, 2, 5)$, $\bar{e_2}(1, 3, 2)$, $\bar{e_3}(-2, -7, 1)$.
16.	$\bar{a}(-1, -7, -5)$, $\bar{e_1}(1, 2, 1)$, $\bar{e_2}(4, -3, -4)$, $\bar{e_3}(2, 1, 0)$.
17.	$\bar{a}(1, 2, 1)$, $\bar{e_1}(-8, -5, 1)$, $\bar{e_2}(29, 18, -3)$, $\bar{e_3}(-11, -7, 1)$.
18.	$\bar{a}(2, -4, 1)$, $\bar{e_1}(1, 3, 2)$, $\bar{e_2}(2, 2, -1)$, $\bar{e_3}(-3, -4, 0)$.
19.	$\bar{a}(3, 8, 8)$, $\bar{e_1}(1, 3, 2)$, $\bar{e_2}(1, 2, 5)$, $\bar{e_3}(-2, -7, 1)$.

20.	$\bar{a}(1,\ 1,\ 0),\ \bar{e}_1(1,\ 0,\ -4),\ \bar{e}_2(0,\ 2,\ 1),\ \bar{e}_3(-1,\ -3,\ 3).$
21.	$\bar{a}(0,\ 1,\ 0),\ \bar{e}_1(2,\ 1,\ -1),\ \bar{e}_2(2,\ 1,\ -2),\ \bar{e}_3(3,\ 0,\ 1).$
22.	$\bar{a}(1,\ 2,\ 0),\ \bar{e}_1(2,\ 2,\ -1),\ \bar{e}_2(2,\ -1,\ 2),\ \bar{e}_3(-1,\ 2,\ 2).$
23.	$\bar{a}(-2,\ 3,\ 1),\ \bar{e}_1(2,\ 1,\ 1),\ \bar{e}_2(-3,\ 4,\ -4),\ \bar{e}_3(1,\ 2,\ 0).$
24.	$\bar{a}(1,\ -1,\ 1),\ \bar{e}_1(1,\ 3,\ 2),\ \bar{e}_2(2,\ 2,\ -1),\ \bar{e}_3(-3,\ -4,\ 0).$
25.	$\bar{a}(-3,\ -2,\ 1),\ \bar{e}_1(1,\ 2,\ 1),\ \bar{e}_2(4,\ -3,\ -4),\ \bar{e}_3(2,\ 1,\ 0).$
26.	$\bar{a}(0,\ 2,\ 1),\ \bar{e}_1(2,\ 1,\ -1),\ \bar{e}_2(2,\ -1,\ 2),\ \bar{e}_3(3,\ 0,\ 1).$
27.	$\bar{a}(1,\ -1,\ 3),\ \bar{e}_1(2,\ 1,\ 0),\ \bar{e}_2(1,\ 0,\ 5),\ \bar{e}_3(0,\ 3,\ -1).$
28.	$\bar{a}(2,\ 3,\ 5),\ \bar{e}_1(1,\ 1,\ -1),\ \bar{e}_2(1,\ -1,\ 1),\ \bar{e}_3(-1,\ 1,\ 1).$
29.	$\bar{a}(1,\ 3,\ 5),\ \bar{e}_1(3,\ -2,\ 1),\ \bar{e}_2(-2,\ 1,\ 3),\ \bar{e}_3(2,\ 0,\ -2).$
30.	$\bar{a}(1,\ -1,\ 1),\ \bar{e}_1(1,\ 2,\ 0),\ \bar{e}_2(0,\ 1,\ 3),\ \bar{e}_3(5,\ 0,\ -1).$

IV. От общего уравнения прямой перейти к параметрическому и с угловым коэффициентом уравнениям прямой.

1.	$2x-3y+1=0$
2.	$3x+2y-5=0$
3.	$2x+3y-2=0$
4.	$x-2y+4=0$
5.	$3x-6y+5=0$
6.	$-3x+2y-4=0$
7.	$-x+5y-10=0$
8.	$4x+3y-1=0$
9.	$3x+2y-4=0$
10.	$5x-y+4=0$
11.	$3x-2y+5=0$
12.	$4x-3y-2=0$
13.	$-x+4y-8=0$
14.	$2x-3y-2=0$
15.	$2x+5y+2=0$
16.	$3x+4y-7=0$
17.	$3x-2y+6=0$
18.	$x-4y+12=0$
19.	$2x-5y+10=0$
20.	$4x-3y+12=0$
21.	$2x+3y-12=0$
22.	$-x+4y-8=0$
23.	$2x-4y+1=0$
24.	$3x-4y+8=0$
25.	$x-4y+4=0$
26.	$-2x+y-1=0$
27.	$2x-2y+1=0$
28.	$3x+y+10=0$
29.	$3x-y-2=0$
30.	$x-2y-1=0$

V. Написать уравнение плоскости, проходящей через точку A перпендикулярно вектору $\overline{BC}$.

1.	$A(1,\ 3,\ 2),\ B(2,\ 1,\ 4),\ C(3,\ 1,\ 0).$
2.	$A(-1,\ 2,\ -1),\ B(3,\ -1,\ 2),\ C(4,\ 1,\ 2).$
3.	$A(2,\ 0,\ 1),\ B(-1,\ 2,\ -1),\ C(3,\ 1,\ -1).$
4.	$A(2,\ -1,\ 3),\ B(1,\ 2,\ 2),\ C(1,\ 3,\ 1).$
5.	$A(1,\ 3,\ -1),\ B(0,\ 5,\ -1),\ C(1,\ 2,\ 3).$
6.	$A(1,\ 4,\ -2),\ B(1,\ -1,\ 0),\ C(3,\ 1,\ 2).$
7.	$A(0,\ -1,\ 1),\ B(2,\ -1,\ -1),\ C(1,\ 1,\ 1).$
8.	$A(2,\ 0,\ -3),\ B(3,\ 0,\ 1),\ C(2,\ 1,\ 3).$
9.	$A(3,\ -1,\ 0),\ B(4,\ 1,\ 1),\ C(2,\ 3,\ 1).$
10.	$A(1,\ -1,\ 0),\ B(2,\ 3,\ -1),\ C(1,\ -4,\ 5).$
11.	$A(1,\ 0,\ -3),\ B(2,\ -4,\ 1),\ C(1,\ -2,\ 0).$
12.	$A(2,\ -3,\ 0),\ B(1,\ -5,\ 2),\ C(3,\ -1,\ 0).$
13.	$A(1,\ -4,\ 0),\ B(2,\ -1,\ 3),\ C(1,\ 3,\ 2).$
14.	$A(0,\ 5,\ -1),\ B(3,\ -1,\ 2),\ C(1,\ -4,\ 0).$
15.	$A(1,\ 2,\ -3),\ B(3,\ 0,\ 2),\ C(1,\ 2,\ 4).$
16.	$A(0,\ -1,\ 3),\ B(1,\ 2,\ -1),\ C(1,\ 4,\ 3).$
17.	$A(2,\ 0,\ -1),\ B(1,\ 4,\ -2),\ C(1,\ 5,\ 1).$
18.	$A(3,\ -2,\ 0),\ B(1,\ 3,\ -1),\ C(2,\ 4,\ 2).$
19.	$A(0,\ -1,\ 4),\ B(1,\ 2,\ -2),\ C(3,\ 1,\ 1).$
20.	$A(1,\ 2,\ -1),\ B(0,\ 4,\ 3),\ C(2,\ 5,\ 4).$
21.	$A(1,\ 0,\ -3),\ B(0,\ 2,\ 3),\ C(3,\ 1,\ 4).$
22.	$A(0,\ -2,\ 4),\ B(3,\ 1,\ -1),\ C(5,\ -3,\ 2).$
23.	$A(1,\ 0,\ -3),\ B(0,\ -3,\ 4),\ C(2,\ 1,\ 5).$
24.	$A(0,\ -2,\ 3),\ B(1,\ -2,\ 0),\ C(-1,\ 3,\ 2).$
25.	$A(2,\ 0,\ -4),\ B(2,\ 3,\ -1),\ C(3,\ -1,\ 2).$
26.	$A(3,\ 1,\ 4),\ B(3,\ -1,\ 2),\ C(4,\ -2,\ -1).$
27.	$A(1,\ 2,\ -3),\ B(3,\ 1,\ 4),\ C(2,\ -1,\ -1).$
28.	$A(1,\ 2,\ -2),\ B(2,\ 1,\ 5),\ C(1,\ -5,\ 2).$
29.	$A(0,\ 2,\ 3),\ B(3,\ -1,\ 2),\ C(1,\ 0,\ -3).$
30.	$A(1,\ -2,\ 0),\ B(1,\ -4,\ 0),\ C(0,\ -1,\ 1).$

VI. От общего уравнения прямой перейти к каноническому уравнению.

1.	$\begin{cases}2x-y+3z-1=0\\x+2y-z+2=0\end{cases}$	2.	$\begin{cases}3x-y-z+2=0\\2x+y-z+1=0\end{cases}$
3.	$\begin{cases}x-2y+z+1=0\\2x+y+z+4=0\end{cases}$	4.	$\begin{cases}x-3y+z+2=0\\2x+y-z+1=0\end{cases}$
5.	$\begin{cases}x+y+z+1=0\\2x+y+z+1=0\end{cases}$	6.	$\begin{cases}x+2y-z+2=0\\2x+y-z+1=0\end{cases}$
7.	$\begin{cases}2x-y-z+3=0\\x-y+z+4=0\end{cases}$	8.	$\begin{cases}x+3y-z-1=0\\2x+y+z+1=0\end{cases}$
9.	$\begin{cases}x-2z+1=0\\2x+y-z+1=0\end{cases}$	10.	$\begin{cases}x-y+2z+1=0\\y-z+3=0\end{cases}$
11.	$\begin{cases}2x-y+z+4=0\\x+y-2z-2=0\end{cases}$	12.	$\begin{cases}3x-y+z+6=0\\2x-y+z+4=0\end{cases}$
13.	$\begin{cases}x+2y+5=0\\x-y+z+1=0\end{cases}$	14.	$\begin{cases}x+y+2z+1=0\\x-y-z+2=0\end{cases}$

15.	$\begin{cases} 2x-y+z+2=0 \\ x+2y-z-2=0 \end{cases}$	16.	$\begin{cases} 3x-y+z+3=0 \\ 2x+y-2z+4=0 \end{cases}$
17.	$\begin{cases} x+y+z-3=0 \\ 2x+y-z+2=0 \end{cases}$	18.	$\begin{cases} 3x-y+z+3=0 \\ x+y+4=0 \end{cases}$
19.	$\begin{cases} x+2y-z+4=0 \\ y+z+2=0 \end{cases}$	20.	$\begin{cases} x-y-z+2=0 \\ 2x+z+4=0 \end{cases}$
21.	$\begin{cases} 2x+y-z+2=0 \\ x-y+2z+4=0 \end{cases}$	22.	$\begin{cases} x+2y+4=0 \\ 3x-y+z+3=0 \end{cases}$
23.	$\begin{cases} x-y+2z+4=0 \\ -2y+z+2=0 \end{cases}$	24.	$\begin{cases} x+y+z+1=0 \\ x-y+z-1=0 \end{cases}$
25.	$\begin{cases} 2x+y-2z+4=0 \\ x+2y-z+2=0 \end{cases}$	26.	$\begin{cases} 2x-y+2z-3=0 \\ x+2y-z-1=0 \end{cases}$
27.	$\begin{cases} x+2y-3z-5=0 \\ 2x-y+z+2=0 \end{cases}$	28.	$\begin{cases} 3x-y+2z-7=0 \\ x+3y-2z-3=0 \end{cases}$
29.	$\begin{cases} 2x+2y-z-10=0 \\ x-y-z-22=0 \end{cases}$	30.	$\begin{cases} 2x+y-z-3=0 \\ x+y+z-1=0 \end{cases}$

VII. Найти угол между плоскостями.

1.	$P_1: 2x-3y+5z-7=0, \quad P_2: 2x-3y+5z+3=0.$
2.	$P_1: 4x+2y-4z+5=0, \quad P_2: 2x+y+2z-1=0.$
3.	$P_1: x-3z+2=0, \quad P_2: 2x-6z-7=0.$
4.	$P_1: 3x-y-2z-5=0, \quad P_2: x+9y-3z+2=0.$
5.	$P_1: 2x+3y-z-3=0, \quad P_2: x-y-z+5=0.$
6.	$P_1: 2x-5y+z=0, \quad P_2: x+2z-3=0.$
7.	$P_1: -x+2y-z+1=0, \quad P_2: y+3z-1=0.$
8.	$P_1: 2x-y+z-1=0, \quad P_2: -4x+2y-2z-1=0.$
9.	$P_1: x-y+1=0, \quad P_2: y-z+1=0.$
10.	$P_1: 2x-y-z+1=0, \quad P_2: -4x+2y+2z-2=0.$
11.	$P_1: 3x-y+2z-3=0, \quad P_2: x-2y-z+4=0.$
12.	$P_1: 2x-y+5z-1=0, \quad P_2: 3x-2y+6z-1=0.$
13.	$P_1: 2x-y+2z+15=0, \quad P_2: 6x+2y-3z-1=0.$
14.	$P_1: 6x+2y-4z+5=0, \quad P_2: 9x+3y-6z-2=0.$
15.	$P_1: x-y+\sqrt{2}z-5=0, \quad P_2: x=0.$
16.	$P_1: x+2y-z=0, \quad P_2: 2x+y+4z+3=0.$
17.	$P_1: 7x-5y-31=0, \quad P_2: x-y-z-10=0.$
18.	$P_1: 7x-5y-31=0, \quad P_2: 4x+11z+43=0.$
19.	$P_1: x-y-z-10=0, \quad P_2: 4x+11z+43=0.$
20.	$P_1: 5x+3y+10z+30=0, \quad P_2: 4x-5y+10z+20=0.$
21.	$P_1: 5x+3y+10z+30=0, \quad P_2: 6x+11y+30z=0.$
22.	$P_1: 4x-5y+10z+20=0, \quad P_2: 6x+11y+30z=0.$
23.	$P_1: x+y-1=0, \quad P_2: 2x-y+\sqrt{3}z+1=0.$
24.	$P_1: 3x+2y+5z+6=0, \quad P_2: x+4y+3z+4=0.$
25.	$P_1: 3x-2y-z+4=0, \quad P_2: x-4y-3z-2=0.$
26.	$P_1: 2x-3y-2z+1=0, \quad P_2: 5x+2y+2z-7=0.$
27.	$P_1: 5x-y-2z-3=0, \quad P_2: 3x-2y-5z+2=0.$
28.	$P_1: 2x-y+2z-3=0, \quad P_2: x+2y-z-1=0.$
29.	$P_1: x+2y-3z-5=0, \quad P_2: 2x-y+z+2=0.$
30.	$P_1: 3x+2y-z-1=0, \quad P_2: 2x-3y+2z-2=0.$

VIII. Найти расстояние от точки M до плоскости, проходящей через точки M_1, M_2, M_3.

1.	$M(1, 2, 3), \ M_1(1, 0, 2), \ M_2(1, 1, -1), \ M_3(2, 0, 1)$
2.	$M(1, -1, 2), \ M_1(2, -1, 1), \ M_2(2, 0, 1), \ M_3(3, 0, 1)$
3.	$M(2, 1, -3), \ M_1(1, 0, -1), \ M_2(2, 3, 0), \ M_3(1, -1, 1)$
4.	$M(1, -2, 3), \ M_1(-1, 0, 2), \ M_2(0, 1, 0), \ M_3(3, 1, -1)$
5.	$M(2, -1, 3), \ M_1(2, 1, -1), \ M_2(1, -1, 1), \ M_3(0, 1, 1)$
6.	$M(3, -2, 4), \ M_1(1, 0, -1), \ M_2(2, 1, 0), \ M_3(1, -2, 0)$
7.	$M(1, -4, 5), \ M_1(3, 0, 2), \ M_2(1, -1, 2), \ M_3(3, 0, -1)$
8.	$M(2, -3, 1), \ M_1(1, -1, 2), \ M_2(0, 1, 0), \ M_3(2, -1, 1)$
9.	$M(1, -4, 2), \ M_1(1, -1, 1), \ M_2(0, 2, 0), \ M_3(1, 0, 1)$
10.	$M(2, -1, 3), \ M_1(2, 0, 1), \ M_2(1, -2, 0), \ M_3(1, 0, -1)$
11.	$M(3, -2, 4), \ M_1(1, -1, 0), \ M_2(2, -1, 2), \ M_3(1, 0, 1)$
12.	$M(1, -4, 5), \ M_1(2, 1, 1), \ M_2(1, 0, -1), \ M_3(1, -1, 1)$
13.	$M(2, 4, -3), \ M_1(1, -1 1), \ M_2(2, 1, 1), \ M_3(0, -1, -1)$
14.	$M(3, 2, -5), \ M_1(0, 1, -1), \ M_2(2, 0, 3), \ M_3(1, -1, 0)$
15.	$M(1, -2, 3), \ M_1(1, -1, 2), \ M_2(2, 1, -1), \ M_3(1, 1, 1)$
16.	$M(3, -1, 4), \ M_1(0, 2, -1), \ M_2(1, -1, 1), \ M_3(3, 1, 1)$
17.	$M(2, 3, -1), \ M_1(2, 1, 1), \ M_2(1, 2, 1), \ M_3(1, 1, 2)$
18.	$M(1, -4, 2), \ M_1(2, 0, 1), \ M_2(1, 3, -1), \ M_3(1, 1, 1)$
19.	$M(2, -3, 2), \ M_1(1, -1, 2), \ M_2(1, 2, -1), \ M_3(-1, 1, 1)$
20.	$M(1, 4, -3), \ M_1(2, -1, 0), \ M_2(1, 0, 1), \ M_3(0, 2, -2)$
21.	$M(2, 3, -1), \ M_1(1, -1, 0), \ M_2(0, 1, 1), \ M_3(0, 1, 3)$
22.	$M(5, -1, 4), \ M_1(2, -1, 3), \ M_2(1, -2, 1), \ M_3(2, 1, 1)$
23.	$M(4, 3, -1), \ M_1(1, 2, -1), \ M_2(-1, 2, 0), \ M_3(3, 0, 1)$
24.	$M(-5, 3, 1), \ M_1(0, 1, 3), \ M_2(3, 0, 2), \ M_3(1, -1, 0)$
25.	$M(4, -3, 2), \ M_1(1, -2, 0), \ M_2(3, 0, -1), \ M_3(0, 2, 1)$
26.	$M(1, 0, -1), \ M_1(3, -2, 4), \ M_2(2, 1, 0), \ M_3(1, -2, 0)$
27.	$M(1, -2, 0), \ M_1(1, 0, -1), \ M_2(2, 0, 1), \ M_3(2, -1, 3)$
28.	$M(1, -1, 0), \ M_1(2, 0, 3), \ M_2(0, 1, -1), \ M_3(3, 2, -5)$
29.	$M(2, -1, 0), \ M_1(1, 0, 1), \ M_2(0, 2, -2), \ M_3(1, 4, -3)$
30.	$M(-1, 2, 0), \ M_1(3, 0, 1), \ M_2(4, 3, -1), \ M_3(1, 2, -1)$

IX. Найти проекцию точки M на плоскость P.

1.	$M(3, 1, 2), \ P: \ 2x-3y+4z-1=0$
2.	$M(4, -1, 2), \ P: \ x-y+2z-1=0$
3.	$M(2, 0, 3), \ P: \ 2x-y+3z-2=0$
4.	$M(1, -1, 2), \ P: \ 3x+y+2z-1=0$
5.	$M(2, 0, -1), \ P: \ x+2y-z+4=0$
6.	$M(3, 1, -1), \ P: \ x-2y+3z-6=0$
7.	$M(1, -2, 1), \ P: \ 3x-y+2z-3=0$
8.	$M(2, 1, -1), \ P: \ 2x+2y-z-2=0$
9.	$M(3, 1, -2), \ P: \ x-y+z+3=0$
10.	$M(2, 0, -2), \ P: \ x+2y+z-4=0$
11.	$M(1, 1, -2), \ P: \ 2x-y-2z+4=0$

11.	$M(1,\ 1,\ -2),\ \ P:\ 2x-y-2z+4=0$
12.	$M(2,\ 2,\ 3),\ \ P:\ 3x-y+3z+3=0$
13.	$M(1,\ -1,\ 1),\ \ P:\ x+2y-z-3=0$
14.	$M(2,\ 3,\ 1),\ \ P:\ 2x+y-2z+2=0$
15.	$M(1,\ -2,\ 1),\ \ P:\ 3x-y+z+3=0$
16.	$M(1,\ 3,\ -1),\ \ P:\ x-2y+3z-1=0$
17.	$M(2,\ 1,\ -1),\ \ P:\ 2x-y+3z-1=0$
18.	$M(3,\ 1,\ -1),\ \ P:\ x+y-z+2=0$
19.	$M(1,\ 0,\ 1),\ \ P:\ 2x+y-3z-2=0$
20.	$M(2,\ 1,\ -1),\ \ P:\ x-y+3z+3=0$
21.	$M(1,\ 2,\ 3),\ \ P:\ x+2y-z+4=0$
22.	$M(2,\ 1,\ 2),\ \ P:\ 3x+2y+z+1=0$
23.	$M(1,\ -2,\ 3),\ \ P:\ x-y+3z-1=0$
24.	$M(2,\ 3,\ 1),\ \ P:\ 2x-2y+z+2=0$
25.	$M(1,\ 2,\ -2),\ \ P:\ x+2y+z+2=0$
26.	$M(5,\ 2,\ -1),\ \ P:\ 2x-y+3z+23=0$
27.	$M(1,\ 3,\ -4),\ \ P:\ 3x+y-2z=0$
28.	$M(3,\ -4,\ 7),\ \ P:\ 2x-3y+3z-17=0$
29.	$M(5,\ 2,\ -7),\ \ P:\ 2x+3y-4z-15=0$
30.	$M(3,\ -2,\ -4),\ \ P:\ 3x-2y-3z-7=0$

X. Привести уравнение кривой второго порядка к каноническому виду и изобразить графически.

1.	$x^2+y^2-2x+4y+12=0$
2.	$7x^2-7y^2+4x+4y-8=0$
3.	$x^2+4y^2+6x-3y+15=0$
4.	$4x^2+11y^2+64x+42y+51=0$
5.	$9x^2-16y^2+2x-11y+8=0$
6.	$3x^2+3y^2-2x+2y+5=0$
7.	$4x^2+4y^2-2x+2y-5=0$
8.	$16x^2+9y^2-7x+26y-34=0$
9.	$2x^2+2y^2+2x-2y+3=0$
10.	$2x^2+2y^2-2x+y=0$
11.	$x^2-y^2+4x-8y+7=0$
12.	$5x^2+5y^2-2x-2y=0$
13.	$21x^2-9y^2+16x-18y=0$
14.	$x^2+y^2-10x+6y-25=0$
15.	$x^2-9y^2-3x+y=0$
16.	$13x^2-7y^2+18x+6y-3=0$
17.	$4x^2-y^2-4x-8y-20=0$
18.	$5y^2-12x-22y+19=0$
19.	$9x^2+6y^2-32x+4y+24=0$
20.	$3x^2-3y^2-16x+16y+24=0$
21.	$9x^2-6y^2+6x-8y+2=0$
22.	$x^2+y^2-2x+2y-5=0$

23.	$2x^2-2y^2+6x+6y+15=0$
24.	$x^2-4y^2+4x-13y+10=0$
25.	$5x^2+5y^2+4x-4y-1=0$
26.	$5x^2-2y^2-2x+2=0$
27.	$x^2+2y^2+6y+9=0$
28.	$5x^2+y^2-6x-2y+2=0$
29.	$x^2-10y^2+10x-32y+26=0$
30.	$x^2+3y^2-6x-12y+9=0$