

Find equation of plane passing through points (1,-1, 2) and (2,-2,2) and which is perpendicular to the plane $6x-2y+2z=9$?

Solution.

Plane which is perpendicular to the given plane should be parallel to the normal vector of this plane.

Find coordinates of normal vector from the equation $6x-2y+2z=9$: $\vec{n} = \{6, -2, 2\}$

Let's find the equation of a plane passing through points (1,-1, 2) and (2,-2,2) and parallel to \vec{n} :

$$\begin{vmatrix} x-1 & y+1 & z-2 \\ 2-1 & -2+1 & 2-2 \\ 6 & -2 & 2 \end{vmatrix} = 0,$$

$$-2(x-1) - 2(z-2) + 0 \cdot 6(y+1) + 6(z-2) - 0 \cdot (-2)(x-1) - 2(y+1) = 0,$$

$$-2x + 2 - 2z + 4 + 6z - 12 - 2y - 2 = 0,$$

$$-2x - 2y + 4z - 8 = 0,$$

$$x + y - 2z + 4 = 0.$$

Answer.

$$x + y - 2z + 4 = 0.$$