11.6 #12

$\vec{n}_1 = \langle 3, 2, -1 \rangle \perp P_1$

$\vec{n}_2 = \langle 0, -1, 1 \rangle \perp P_2$

So $\vec{n} = \vec{n}_1 \times \vec{n}_2$ is a normal to the solution plane

$$\vec{n} = \begin{vmatrix} \vec{i} & \vec{j} & \vec{k} \\ 3 & 2 & -1 \\ 0 & -1 & 1 \end{vmatrix} = \vec{i} \begin{vmatrix} 2 & -1 \\ -1 & 1 \end{vmatrix} - \vec{j} \begin{vmatrix} 3 & -1 \\ 0 & 1 \end{vmatrix} + \vec{k} \begin{vmatrix} 3 & 2 \\ 0 & -1 \end{vmatrix}$$

$$= (2-1)\vec{i} - (3-0)\vec{j} + (-3-0)\vec{k} = \langle 1, -3, -3 \rangle$$

Solution plane: $1(x+2) - 3(y-1) - 3(z-5) = 0$

$x + 2 - 3y + 3 - 3z + 15 = 0$

$x - 3y - 3z = -20$

either answer is fine