

■ 08 - 12 - 15 - S11

[11.5] #14

The normal vector to the plane is $\vec{n} = \langle 2, -1, 1 \rangle$. Since the line parallel to \vec{n} goes through point $P(5, 1, 0)$, the equation of the line is $\vec{r}(t) = \langle x, y, z \rangle = \langle 5, 1, 0 \rangle + t \langle 2, -1, 1 \rangle$. Written as parametric equations,

$$x = 5 + 2t, y = 1 - t, z = t.$$

To see where the line intersects the xy -plane, let $z = 0$. Then, $t = 0$, so $x = 5$, $y = 1$. So line intersects the xy -plane at $(5, 1, 0)$. Similarly, the line intersects the yz -plane when $t = \frac{-5}{2}$, at $(0, \frac{7}{2}, \frac{-5}{2})$; and the line intersects the xz -plane when $t = 1$ at $(7, 0, 1)$.