

**Exercise 24**

Find the points of intersection of the line  $x = 3 + 2t$ ,  $y = 7 + 8t$ ,  $z = -2 + t$ , that is,  $\mathbf{l}(t) = (3 + 2t, 7 + 8t, -2 + t)$ , with the coordinate planes.

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**Solution**

Set  $t = -3/2$  to get the line's intersection with the  $yz$ -plane.

$$\mathbf{l}\left(-\frac{3}{2}\right) = \left(0, -5, -\frac{7}{2}\right)$$

Set  $t = -7/8$  to get the line's intersection with the  $xz$ -plane.

$$\mathbf{l}\left(-\frac{7}{8}\right) = \left(\frac{5}{4}, 0, -\frac{23}{8}\right)$$

Set  $t = 2$  to get the line's intersection with the  $xy$ -plane.

$$\mathbf{l}(2) = (7, 23, 0)$$