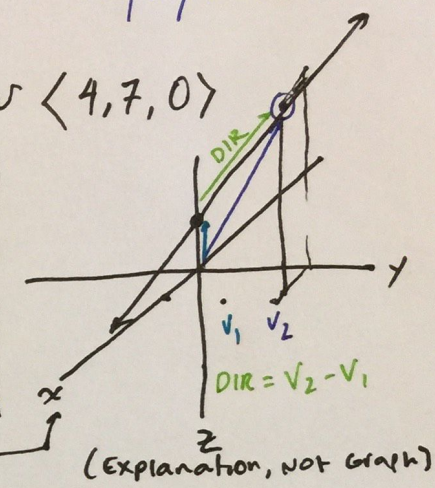
Lyell & Read — CH 11.5 Homework — 10/2/2018

x=9..23 | x%2!=0

9) Line through (0,0,1) in the direction of $v\langle 4,7,0\rangle$

$\boxed{r(t)=\langle 0,0,1\rangle + tv}$ | $v=\langle 4,7,0\rangle$




11) Line through (0,0,1) ∥ y-axis (j)

$\boxed{r(t)=\langle 0,0,1\rangle + tj}$ | $j=\langle 0,1,0\rangle$

13) Line through (0,0,0) and (1,2,3)

$\langle 1,2,3\rangle - \langle 0,0,0\rangle = \langle 1,2,3\rangle$ = "Direction"

$r(t)=\langle 0,0,0\rangle + t\langle 1,2,3\rangle = \boxed{+\langle 1,2,3\rangle}$

15) Line thru (-3,4,6) and (5,-1,0)

$\langle 5,-1,0\rangle - \langle -3,4,6\rangle = \langle 8,-5,-6\rangle$ = "DIRECTION"

$\boxed{r(t)=\langle -3,4,6\rangle + t\langle 8,-5,-6\rangle}$

17) $r(t)=\langle 3-2t, 5+8t, 7-4t\rangle$ | # incl (0,0,0)

$\boxed{r(t)=t\langle -2,8,-4\rangle}$

19) Line thru 0 ⊥ ($u=\langle 1,0,2\rangle$ & $v=\langle 0,1,1\rangle$)

$$u\times v=\begin{vmatrix} i & -j & k \\ 1 & 0 & 2 \\ 0 & 1 & 1 \end{vmatrix} = i\begin{vmatrix} 0 & 2 \\ 1 & 1 \end{vmatrix} - j\begin{vmatrix} 1 & 2 \\ 0 & 1 \end{vmatrix} + k\begin{vmatrix} 1 & 0 \\ 0 & 1 \end{vmatrix} = \boxed{\langle -2,-1,1\rangle t = r(t)}$$

$(0-2) - (1-0) + (1)$

21) Redundant with [19]

23) Line thru (1,2,3) ⊥ ($r_1(t)=\langle 3-2t, 5+8t, 7-4t\rangle$ and $r_2(t)=\langle -2t, 5+t, 7-t\rangle$)

DIRECTION = cross of the two fxn's directions: $\langle -2,8,-4\rangle \times \langle -2,1,-1\rangle$

$$= \begin{vmatrix} i & -j & k \\ -2 & 8 & -4 \\ -2 & 1 & -1 \end{vmatrix} = i\begin{vmatrix} 8 & -4 \\ 1 & -1 \end{vmatrix} - j\begin{vmatrix} -2 & -4 \\ -2 & -1 \end{vmatrix} + k\begin{vmatrix} -2 & 8 \\ -2 & 1 \end{vmatrix}$$

$(-8+4) - (2-8) + (-2+16)$

$\boxed{r(t)=\langle 1,2,3\rangle + t\langle -4,6,14\rangle}$ DIR = $\langle -4,6,14\rangle$