2ª Lista - Parte II

6 a) $\vec{u} = (3,0,1)$, $\vec{v} = (1,m,4)$ e $\vec{w} = (-2,2,3)$

$$\begin{vmatrix} 3 & 0 & 1 & 3 & 0 \\ 1 & m & 4 & 1 & m \\ -2 & 2 & 3 & -2 & 2 \end{vmatrix} = 0$$

$9m + 2 - (-2m + 24)$

$9m + 2 + 2m - 24$

$11m - 22 = 0$

$11m = 22$

$m = \frac{22}{11}$

$m = 2$

b) $A(1,0,2)$ $B(3,-1,4)$ $C(0,2,5)$ $D(2,1,0)$

$\overrightarrow{AB} = 3-1, -1-0, 4-2 = (2,-1,2)$

$\overrightarrow{AC} = 0-1, 2-0, 5-2 = (-1,2,3)$

$\overrightarrow{AD} = 2-1, 1-0, 0-2 = (1,1,-2)$

$$V = \left| \begin{vmatrix} 2 & -1 & 2 & 2 & -1 \\ -1 & 2 & 3 & -1 & 2 \\ 1 & 1 & -2 & 1 & 1 \end{vmatrix} \right| = -8 - 3 - 2 - (4 + 6 - 2) \qquad V = |-21| = 21$$

$-8 - 3 - 2 - 4 - 6 + 2$

$= -12 - 9 = -21$

c) $\vec{u} = (1,2,4)$ $\vec{v} = (2,0,m)$ $\vec{w} = (-1,4,2)$

$$\frac{1}{6}\left| \begin{vmatrix} 1 & 2 & 4 & 1 & 2 \\ 2 & 0 & m & 2 & 0 \\ -1 & 4 & 2 & -1 & 4 \end{vmatrix} \right| = 3$$

$|11 = 18$

$-2m + 32 - (6m + 8) = 18$

$|-6m + 24| = 18$

$-6m + 24 = 18$

$-6m = -6$

$m = 1$

$-6m + 24 = -18$

$-6m = -42$

$m = 7$

7a) $A(3,-1,2)$ $\vec{v}(2,-3,4)$ $P(0,5,-4)$ P ∈ pert

$\begin{cases} x = 3+2t \\ y = -1-3t \\ z = 2+4t \end{cases}$ → $0 = 3+2t$ → $-3 = 2t$ → $t = -3/2$
→ $5 = -1-3t$ → $-6 = 3t$ → $t = -2$
→ $-4 = 2+4t$ → $-6 = 4t$ → $t = -3/2$

b) $A(2,5,-11)$ e $B(0,3,-5)$ $P(3,0,4)$

$\vec{r} = (0-2), (3-5), (-5+11) = (2,-2,6)$

$x = -2+2t$
$y = 5-2t$
$z = -11+6t$

→ $t = \frac{x+2}{2} = \frac{5-y}{2} = \frac{z+11}{6}$

P contido

$\frac{3+2}{2} = \frac{5-0}{2} = \frac{4+11}{6}$

$\frac{5}{2}$ $\frac{5}{2}$ $\frac{5}{2}$

c) $3+2t = -2+2s$
$3+2 = 2s-2t$
$-\frac{5}{2} = t-s$
$t = -\frac{5}{2}+s$

$-1-3t = 5-2s$
$-1-3\left(\frac{5}{2}+s\right) = 5-2s$
$-1+\frac{15}{2}-3s = 5-2s$
$\frac{13}{2}-3s = 5-2s$
$\frac{13}{2}-5 = s$
$\frac{3}{2} = s$

$\frac{-5}{2} = t - \frac{3}{2}$
$t = \frac{-5}{2} + \frac{3}{2}$
$= -1$

$3+2(-1) = 1$, $-1-3(-1) = 2$, $2+4(-1) = -2$

R: (1, 2, -2)

8) a $A(1,0,2)$ $B(-1,2,-1)$ $C(1,1,-1)$

$\overrightarrow{AB} = (-1-1, 2-0, -1-2) = (-2,2,-3)$

$\overrightarrow{AC} = (1-1, 1-0, -1-2) = (0,1,-3)$

b)
$$\begin{vmatrix} i & j & k & i & j \\ -2 & 2 & -3 & -2 & 2 \\ 0 & 1 & -3 & 0 & 1 \end{vmatrix} = -6i - 2k - (-3i + 6j)$$
$$= -6i - 2k + 3i - 6j$$
$$= -3i - 2k - 6j$$

$-3(x-1) - 6(y-0) - 2(z-2$
$-3x + 3 - 6y - 2z + 4$
$-3x - 6y - 2z + 7 = 0$

$x, y, z = (1,0,2) + h(-2,2,-3) + t(0,1,-3)$

$x = 1 - 2h, \quad y = 2h + t, \quad z = 2 - 3h - 3t$

b) $A(2,0,-2)$

$\vec{v} = \vec{i} - \vec{j} + \vec{k}$ e $\vec{v} = 2\vec{i} + 3\vec{j}$

$\rightarrow 1 - 1 + 1$ $\rightarrow 2, 3, 0$

$$\begin{vmatrix} i & j & k & i & j \\ 1 & -1 & 1 & 1 & -1 \\ 2 & 3 & 0 & 2 & 3 \end{vmatrix} = 2j + 3k - (-2k + 3i)$$
$$2j + 3k + 2k - 3i$$
$$2j + 5k - 3i$$
$$(3, 2, 5)$$

$-3(x-2) + 2(y-0) + 5(z+$
$-3x + 6 + 2y + 5z + 10$
$-3x + 2y + 5z + 16$

$x, y, z = (2,0,-2) + h(1,-1,+1) + t(2,3,0)$

$$\begin{cases} x = 2 + h + 2t \\ y = -h + 3t \\ z = -2 + h \end{cases}$$