Primeira mini prova de AVLC

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CPF: 125.769.454-57

* A(1,0,0)
  B(0,2,0)
  C(0,0,3)
  P(1,-1,0) -> (x,y,z)

a) * vetores do plano:

$\overline{AB}$ (0,2,0) - (1,0,0) => (-1, 2, 0)

$\overline{AC}$ (0,0,3) - (1,0,0) => (-1, 0, 3)

* Produto vetorial (definir o vetor normal "$\overline{n}$")

| $\hat{i}$ | $\hat{j}$ | $\hat{k}$ | $\hat{i}$ | $\hat{j}$ |
|---|---|---|---|---|
| -1 | 2 | 0 | -1 | 2 |
| -1 | 0 | 3 | -1 | 0 |

$6\hat{i} + 0\hat{j} + 0\hat{k} + 3\hat{j} - 0\hat{i} + 2\hat{k}$

$6\hat{i} + 3\hat{j} + 2\hat{k}$

$\overline{n} = (6,3,2)$

↓ ↓ ↓

a b c

* equação geral do plano:

$$a(x - x_0) + b(y - y_0) + c(z - z_0) + d = 0$$

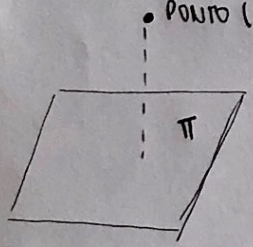
$$6x + 3y + 2z - 6 = 0$$

$$\boxed{d = -6}$$

* Equação final:

$$6x + 3y + 2z - 6 = 0$$

b)




$\pi = 6x + 3y + 2z - 6 = 0$

$$d(P_0, \pi) = \frac{|ax_0 + by_0 + cz_0 + d|}{\sqrt{a^2 + b^2 + c^2}} =>$$

$$d(P_0, \pi) = \frac{|6 \cdot 1 + 3 \cdot (-1) + 2 \cdot 0 + (-6)|}{\sqrt{6^2 + 3^2 + 2^2}} =>$$

$$d(P_0, \pi) = \frac{|6 - 3 + 0 - 6|}{\sqrt{49}} => \frac{|3|}{7} =$$

$$d(P_0, \pi) = \boxed{\frac{3}{7}}$$

c) * vetor diretor da reta (PA) , $\bar{n}\ (6,3,2)$

$\bar{PA} = (1,0,0) - (1,-1,0) = (0,1,0)$

$$\operatorname{sen}\theta = \frac{|\bar{PA}\cdot\bar{n}|}{\|\bar{PA}\|\cdot\|\bar{n}\|} = \frac{|3|}{1\cdot 7} \Rightarrow \operatorname{sen}\theta = \frac{3}{7}, \quad \boxed{\theta = \operatorname{arc\,sen}\frac{3}{7}}$$

* $(0,1,0)\cdot(6,3,2) = 0\cdot 6 + 1\cdot 3 + 0\cdot 2 = 0+3+0 = 3$
* $\|\bar{PA}\| = \sqrt{0^2+1^2+0^2} = \sqrt{1} = 1$
* $\|\bar{n}\| = \sqrt{6^2+3^2+2^2} = \sqrt{36+9+4} = \sqrt{49} = 7$

② QUESTÃO 2

$\vec{u} = (1,1,0)$
$\vec{v} = (2,0,1)$

$w_1 = 3\vec{u} - 2\vec{v}$
$w_2 = \vec{u} + 3\vec{v}$
$w_3 = \vec{i} + \vec{j} - 2\vec{k}$

* calculando $w_1$ =

$3(1,1,0) - 2(2,0,1)$

$(3,3,0) - (4,0,2)$

$w_1 = (-1,3,-2)$

* calculando $w_2$

$(1,1,0) + 3(2,0,1)$

$(1,1,0) + (6,0,3)$

$w_2 = (7,1,3)$

* calculando $w_3$

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

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

$w_3 = (1,1,-2)$

* PRODUTO MISTO

$[w_1, w_2, w_3] =$

| | | | | | |
|---|---|---|---|---|---|
| -1 | 3 | -2 | -1 | 3 | |
| 7 | 1 | 3 | 7 | 1 | |
| 1 | 1 | -2 | 1 | 1 | |

* $2 + 9 + (-14) - 42 - (-3) - (-2)$

$11 + (-14) - 42 + 3 + 2$

$11 - 14 - 42 + 5$

$11 - 14 + 42 + 5$

$-3 + 47 = 44.$

$\|[w_1, w_2, w_3]\| = |-44| = 44$ UNIDADES DE VOLUME.