

Geometria Analitica - Lista 3

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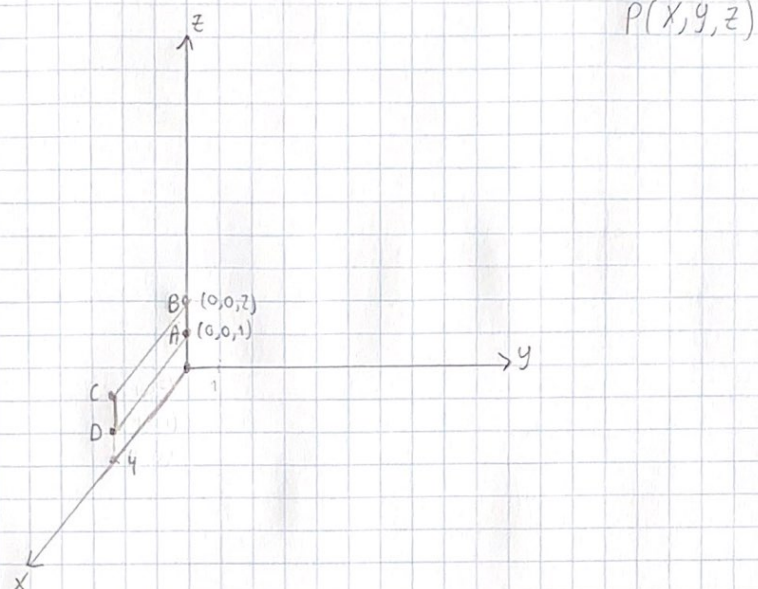
1. a)

$$A(0,0,1)$$

$$B(0,0,2)$$

$$C(4,0,2)$$

$$D(4,0,1)$$



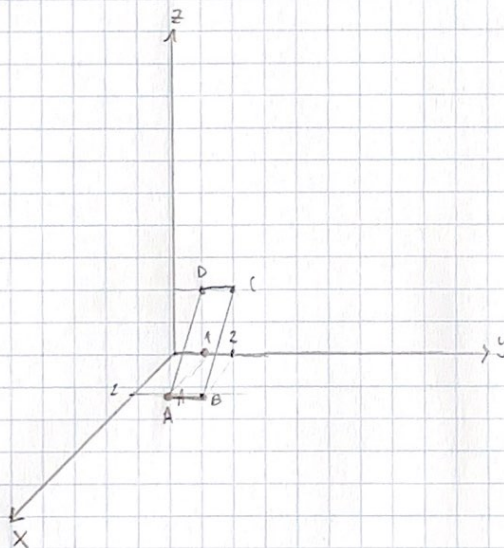
1. b)

$$A(2,1,0)$$

$$B(2,2,0)$$

$$C(0,2,2)$$

$$D(0,1,2)$$



2.

$x \quad y \quad z$
 $A(2, -1, 2)$
 $B(2, -3, 2)$
 $C(3, -3, 2)$
 $D(3, -1, 2)$
 $E(3, -1, 5)$
 $F(2, -1, 5)$
 $G(2, -3, 5)$
 $H(3, -3, 5)$

Medidas do paralelepípedo:

$$2 - y$$

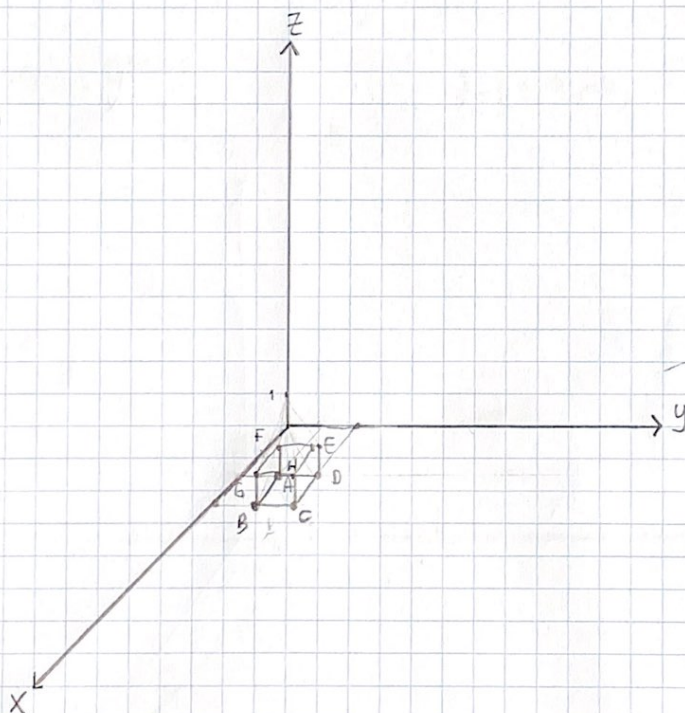
$$1 - x$$

$$3 - z$$

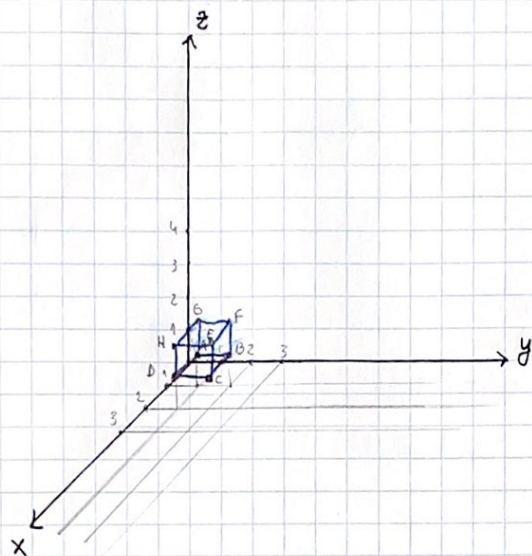
3.

(a)

$A(2, 1, 0)$
 $B(3, 1, 0)$
 $C(3, 2, 0)$
 $D(2, 2, 0)$
 $E(2, 2, 1)$
 $F(2, 1, 1)$
 $G(3, 1, 1)$
 $H(3, 2, 1)$



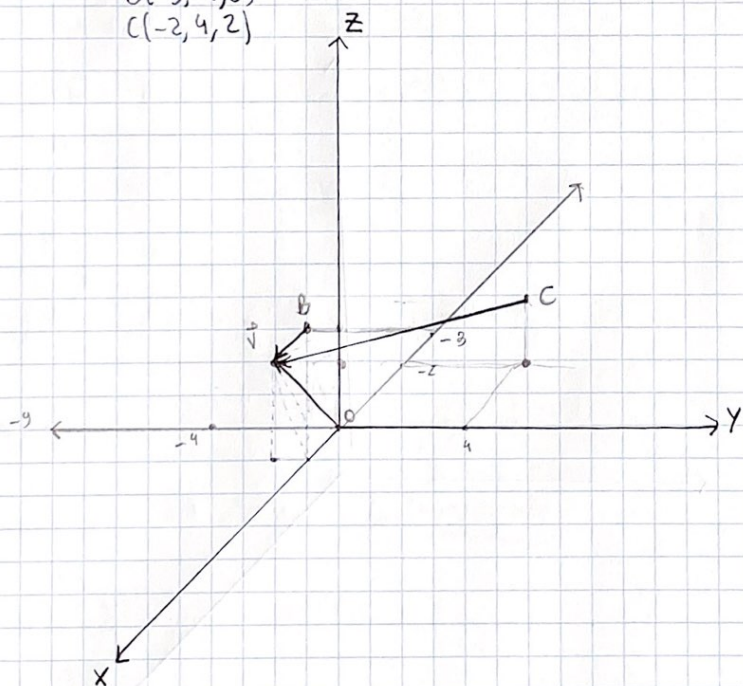
- b)
- A) (1, 1, 1)
 - B) (1, 2, 1)
 - C) (2, 2, 1)
 - D) (2, 1, 1)
 - E) (2, 2, 2)
 - F) (1, 2, 2)
 - G) (1, 1, 2)
 - H) (2, 1, 2)



4)

Origens: $O(0,0,0)$
 $B(-3,-4,0)$
 $C(-2,4,2)$

$$\vec{v} = (1, 3, -4)$$



5. (a) $A + 3\vec{V}$
 $(2, -2, 3) + 3(1, 3, -4)$
 $(2, -2, 3) + (3, 9, -12)$
 $A + 3\vec{V} = (5, 7, -9)$

dados:

$$A(2, -2, 3)$$

$$B(1, 1, 5)$$

$$\vec{V} = (1, 3, -4)$$

(b) $B + 2(B - A)$

$$(1, 1, 5) + 2(-1, 3, 2)$$

$$(1, 1, 5) + (-2, 6, 4)$$

$$B + 2(B - A) = (-1, 7, 9)$$

\downarrow
 $(1, 1, 5) + \overbrace{(-2, 2, -3)}^{-A}$
 $(-1, 3, 2) = B - A$

6. (a) $A(2, 1, -1)$ $\overline{AB} \parallel \overline{BC}$
 $B(3, -1, 0)$ $\overline{AB} = B - A$
 $C(1, 0, 4)$ $\overline{BC} = C - B$

$$(3, -1, 0) + \overbrace{(-2, -1, 1)}^{-A} \left\{ \begin{array}{l} (1, 0, 4) + (-3, 1, 0) \\ (-2, 1, 4) \end{array} \right.$$

$$(1, -2, 1)$$

\hat{n} são colineares

(b) $A(-1, 4, 3)$ $\overline{AB} \parallel \overline{BC}$
 $B(2, 1, 3)$
 $C(4, -1, 7)$

$$\overline{AB} \rightarrow B - A \rightarrow (2, 1, 3) + (1, -4, -3) = (3, -3, 0)$$

$$\overline{BC} \rightarrow C - B \rightarrow (4, -1, 7) + (-2, -1, -3) = (2, -2, 4)$$

} são colineares

7)

$$S(t) = A + t(B - A)$$

$$S(t) = (-1, -2, 3) + t((2, 1, -5) - (-1, -2, 3))$$

$$S(t) = (-1, -2, 3) + t(3, 3, -8)$$

$$P(m, 4, n) \rightarrow (m, 4, n) = (-1, -2, 3) + t(3, 3, -8)$$

$$m = -1 + 3t$$

$$4 = -2 + 3t \rightarrow 3t = 4 + 2 \rightarrow \boxed{t = 2}$$

$$n = 3 - 8t$$

$$m = -1 + 3 \cdot 2$$

$$m = -1 + 6$$

$$\boxed{m = 5}$$

$$n = 3 - 8t$$

$$n = 3 - 8 \cdot 2$$

$$n = 3 - 16$$

$$\boxed{n = -13}$$

8)

a) $\vec{v} = (1, 1, 1)$

if $|\vec{v}| = 1 = \underline{\text{norm}}$

$$|\vec{v}| = \sqrt{1^2 + 1^2 + 1^2}$$

$$= \sqrt{3} \rightarrow \underline{\hat{n} \text{ é unitário}}$$

b)

$$\vec{v} = \left(\frac{1}{\sqrt{6}}, \frac{-2}{\sqrt{6}}, \frac{1}{\sqrt{6}} \right)$$

$$|\vec{v}| = \sqrt{\left(\frac{1}{\sqrt{6}} \right)^2 + \left(\frac{-2}{\sqrt{6}} \right)^2 + \left(\frac{1}{\sqrt{6}} \right)^2}$$

↓

$$= \sqrt{\frac{1}{6} + \frac{4}{6} + \frac{1}{6}}$$

$$= \sqrt{\frac{6}{6}}$$

$$\rightarrow \sqrt{1} = \boxed{1}$$

é um vetor unitário

9

a)

- A) (3,5,0)
- B) (1,5,0)
- C) (3,5,4)
- D) (3,7,0)

$$\vec{AB} = B - A \rightarrow (1,5,0) + (-3,-5,0) \\ (-2,0,0)$$

$$\vec{AC} = C - A \rightarrow (3,5,4) + (-3,-5,0) \\ (0,0,4)$$

$$\vec{AD} = D - A \rightarrow (3,7,0) + (-3,-5,0)$$

$$AB + AC + AD + A = (-2,0,0) + (0,0,4) + (0,3,0) + (3,5,0) + (0,-3,0) \\ \text{ponto } A' \rightarrow (1,2,4)$$

b)

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

$$\vec{AB} = B - A \rightarrow (3,-1,2) + (1,-2,-1) \\ (4,-3,1)$$

$$\vec{AC} = C - A \rightarrow (4,1,-3) + (1,-2,-1) \\ (5,-1,-4)$$

$$\vec{AD} = D - A \rightarrow (0,-3,1) + (1,-2,-1) \\ (1,-5,0)$$

$$AB + AC + AD + A = (4,-3,1) + (5,-1,-4) + (1,-5,0) + (-1,2,1)$$

$$\text{ponto } A' = (9,-7,-4)$$