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Primera parte

Dados los vectores: **A. (2,4,6) B. (3,1,-6) C. (-2,5,0)**

1. Encuentra las constantes α y β tales que $C = \alpha A + \beta B$

$$(-2, 5, 0) = \alpha(2, 4, 6) + \beta(3, 1, -6)$$

$$\mathbf{x)} -2 = 2\alpha + 3\beta \quad -2 = 2 + 3\beta \quad -4 = 3\beta \quad -4 / 3 = \beta$$

$$\mathbf{y)} 5 = 4\alpha + \beta \quad 5 = 4\alpha + \alpha \quad 5 = 5\alpha \quad 1 = \alpha$$

$$\mathbf{z)} 0 = 6\alpha - 6\beta \quad 6\beta = 6\alpha \quad \beta = \alpha$$

$$0 = 6\alpha - 6\beta \quad 0 = 6 + \beta(-4/3) \quad 0 = 6 - -4/3\beta \quad 0 = 18/3 + 4/3\beta \quad 0 = 22/3\beta$$

$$22/3 = \beta$$

No existen

2. Ecuentre

a. $\|A\| \|A\| = \sqrt{2^2 + 4^2 + 6^2} = \mathbf{7.4833}$

b. $\|A+C\| \quad A + C = (2-2), (4+5), (6+0) \quad \|A + C\| = \sqrt{0^2 + 9^2 + 6^2} = \mathbf{10.8166}$

3. Tomando del origen al vector A, y al vector B, determine la magnitud y los componentes del vector resultante de unir los extremos de A y B. Grafica tus vectores.

$$A = (2, 4, 6)$$

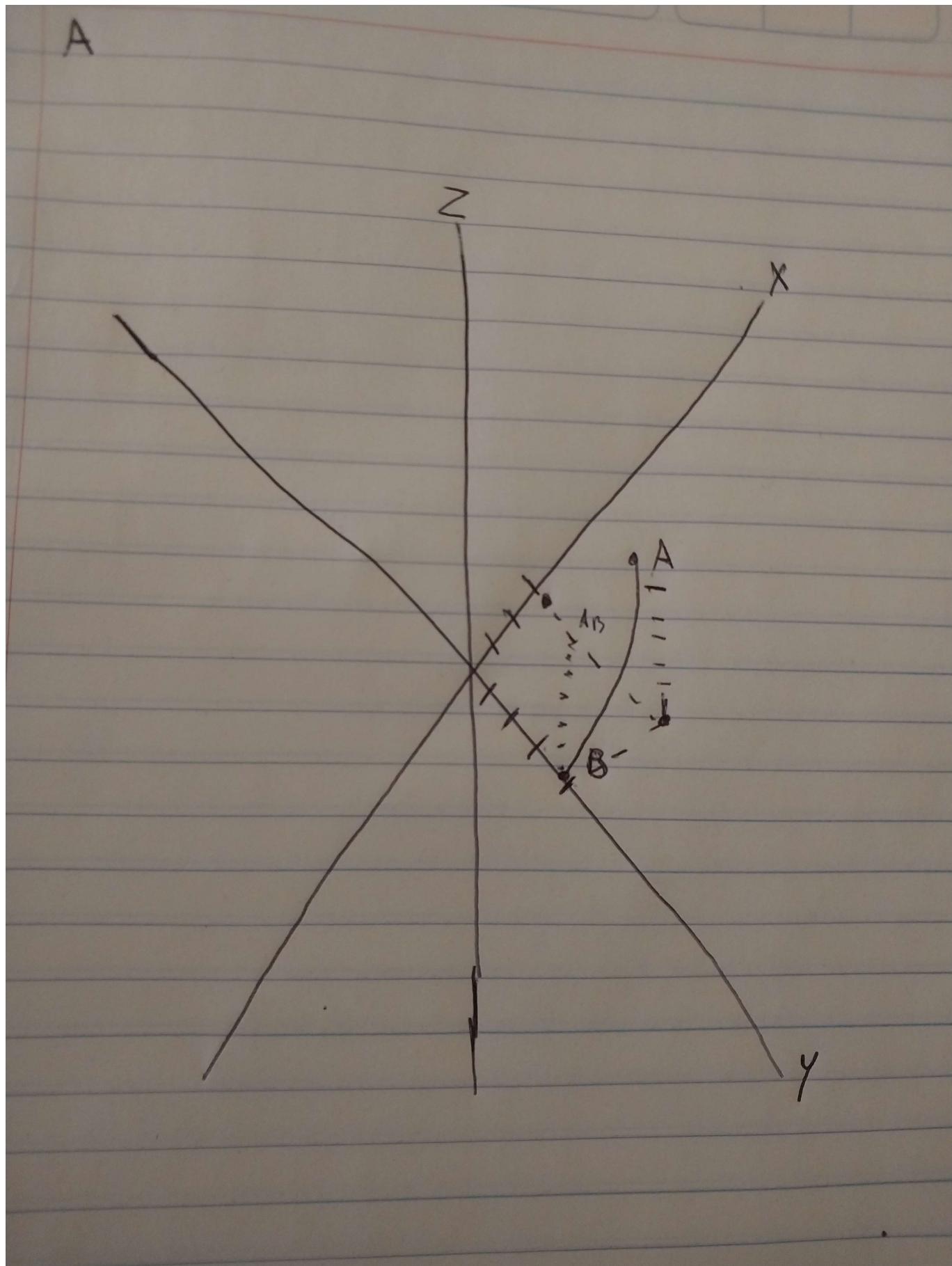
$$B = (3, 1, -6)$$

$$AB = ((Bx - Ax), (By - Ay), (Bz - Az))$$

$$AB = ((3-2), (1-4), (-6-6))$$

$$AB = (1, -3, -12)$$

$$\|AB\| = \sqrt{1^2 + 3^2 + 12^2} = \mathbf{12.4096}$$



Segunda parte

Dados los vectores:

A. $(5, -4, 7)$

B. (7,1,3)

C. (1,8,-5)

D. (3, -6,0)

Calcule los siguientes productos punto 1 y producto cruz 2 y grafique el vector resultante

4. $\mathbf{A} * \mathbf{B} =$

$$\mathbf{A} * \mathbf{B} = (5, -4, 7) * (7, 1, 3)$$

$$\mathbf{A} * \mathbf{B} = (5 * 7) + (-4 * 1) + (7 * 3)$$

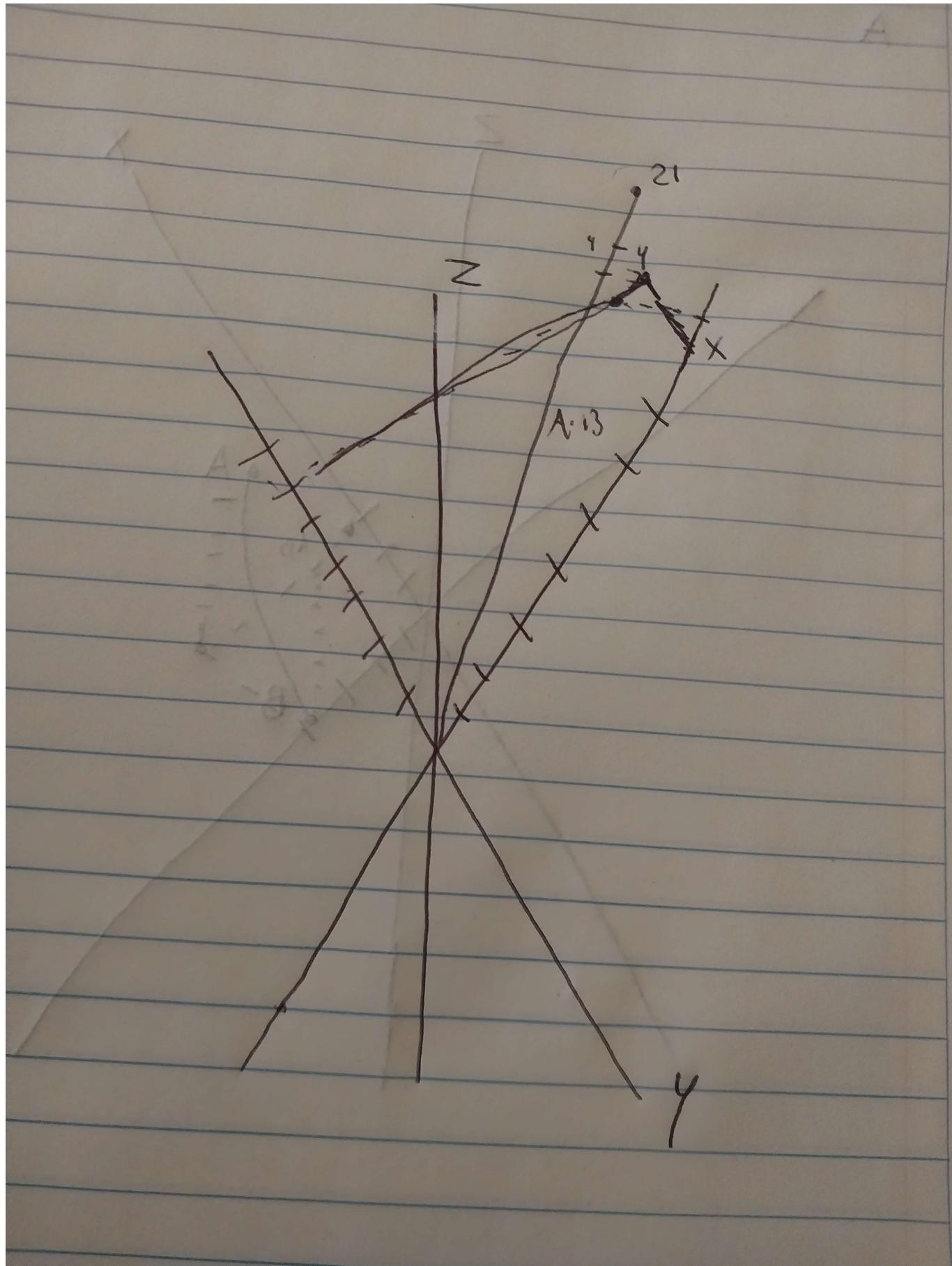
$$\mathbf{A} * \mathbf{B} = 35 - 4 + 21 = 52$$

$$\|\mathbf{A}\| = \sqrt{5^2 + 4^2 + 7^2} = \mathbf{9.4868}$$

$$\|\mathbf{B}\| = \sqrt{7^2 + 1^2 + 3^2} = \mathbf{7.6811}$$

$$\cos\theta = 52 / (9.4868)(7.6811) = \mathbf{0.7136}$$

$$\theta = \cos^{-1}(0.7136) = \mathbf{0.7761}$$



5. B^*D

$$B^*D = (7, 1, 3) * (3, -6, 0)$$

$$B^*D = (7 * 3) + (1 * -6) + (3 * 0)$$

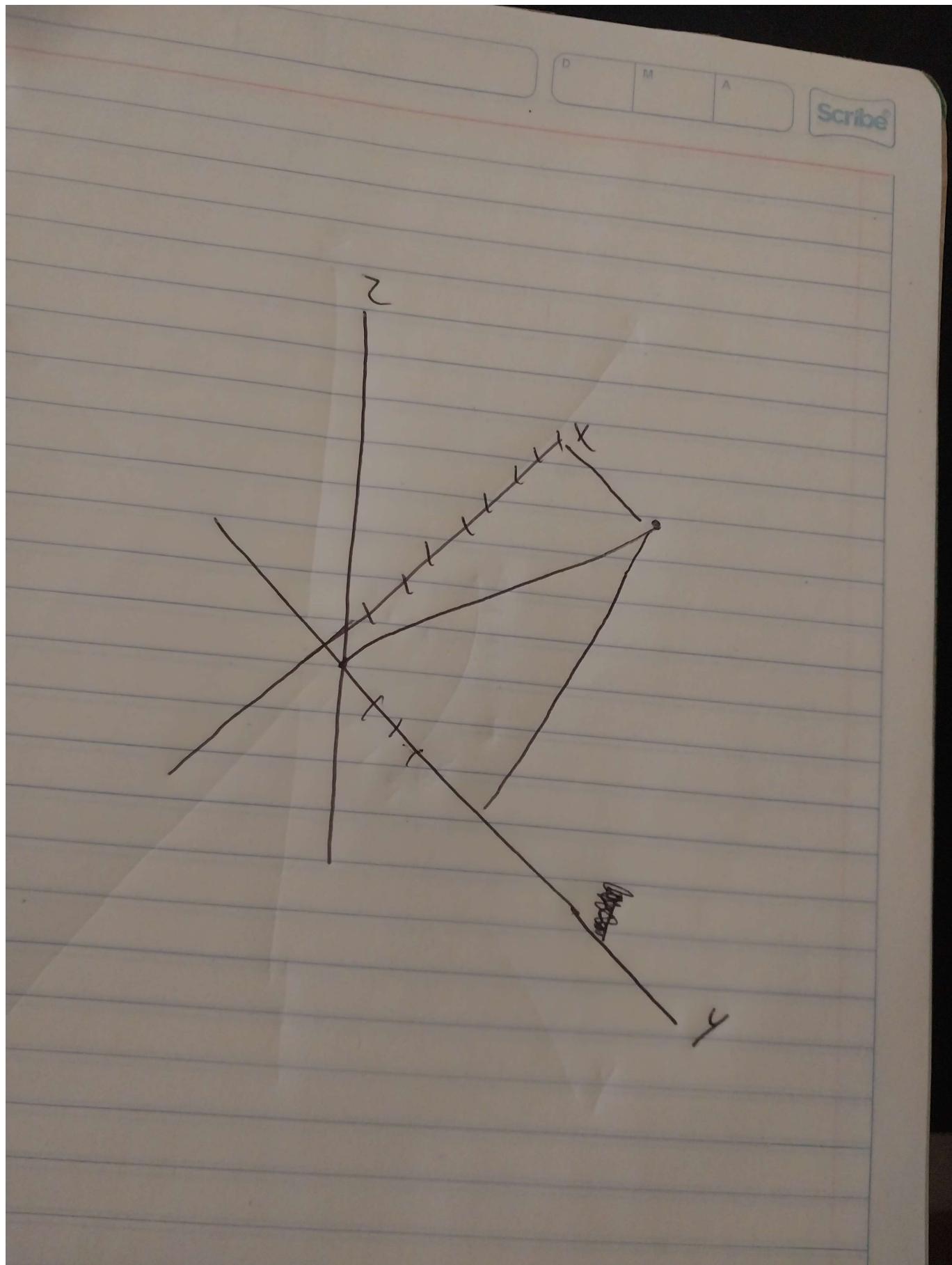
$$\mathbf{B}^*\mathbf{D} = 21 - 6 = 15$$

$$\|\mathbf{B}\| = \sqrt{7^2 + 1^2 + 3^2} = \mathbf{7.6811}$$

$$\|\mathbf{D}\| = \sqrt{3^2 - 6^2 + 0^2} = \mathbf{6.7082}$$

$$\cos\theta = 15 / (7.6811)(6.7082) = \mathbf{0.2911}$$

$$\theta = \cos^{-1}(0.2911) = \mathbf{1.2754}$$



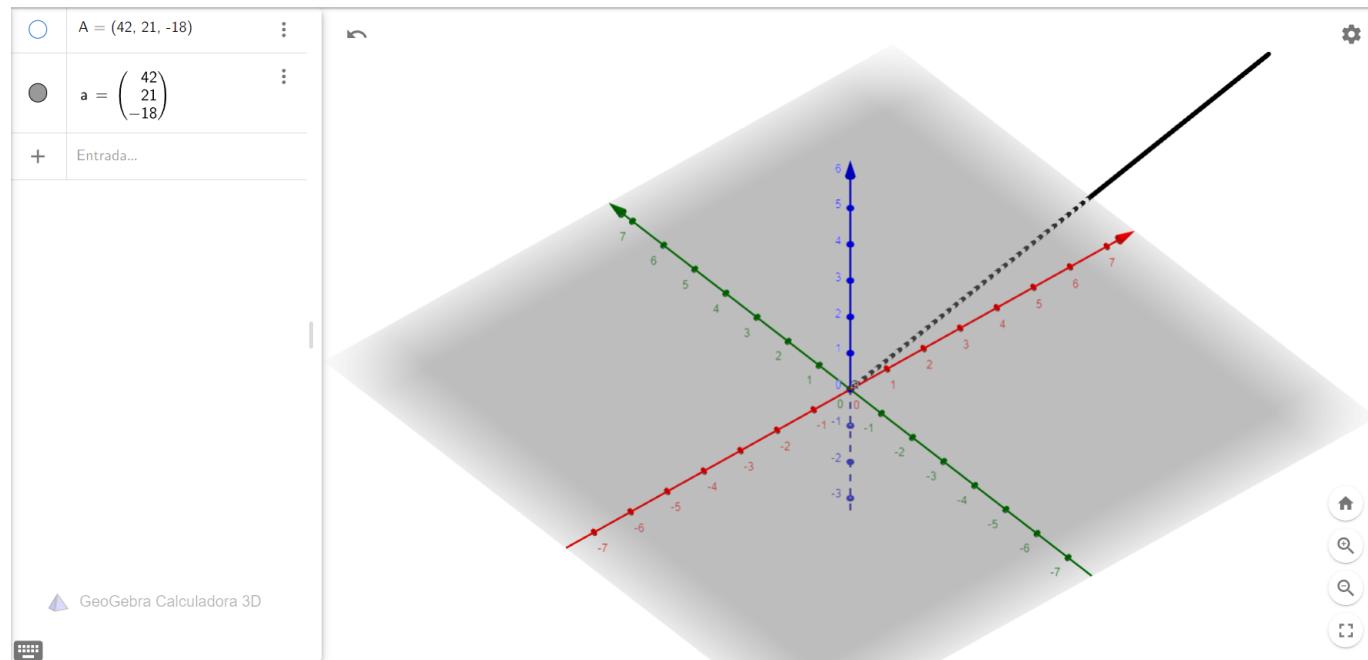
Caso 2 Perpendicular

6. **AxD** $A \times D = (5, -4, 7) \times (3, -6, 0)$

$(-4 * 0) - (7 * -6) = 42 \rightarrow x$

$$(7 * 3) - (5 * 0) = \mathbf{21} \rightarrow \mathbf{y}$$

$$(5 * -6) - (-4 * 3) = \mathbf{-18} \rightarrow \mathbf{z}$$



7. CxB

$$\mathbf{C} \times \mathbf{B} = (1, 8, -5) \times (7, 1, 3)$$

$$(8 * 3) - (-5 * 1) = \mathbf{29} \rightarrow \mathbf{x}$$

$$(-5 * 7) - (1 * 3) = \mathbf{-38} \rightarrow \mathbf{y}$$

$$(1 * 1) - (8 * 7) = \mathbf{-55} \rightarrow \mathbf{z}$$

