



EKINTZA

161

1 2 3
13 2 1
2

6.5

a) $\vec{AB} = (-1 - (-2), -1 - 2) = (1, -3)$

$|\vec{AB}| = \sqrt{1^2 + (-3)^2} = \sqrt{10}$

$|\vec{a}| = \sqrt{(-4)^2 + 3^2} = \sqrt{25}$

$\vec{a} = \left(-\frac{4}{\sqrt{25}}, \frac{3}{\sqrt{25}}\right) \rightarrow \left(-\frac{4}{5}, \frac{3}{5}\right)$

$\vec{a} = (-4\sqrt{10}, 3\sqrt{10})$

b) $\frac{1}{3}\vec{AB} + \vec{OA} = \frac{1}{3}(1, -3) + (-2, -1) = \left(\frac{1}{3}, -1\right) + (-2, -1) = \left(-\frac{5}{3}, -2\right)$

$\frac{2}{3}\vec{AB} + \vec{OA} = \frac{2}{3}(1, -3) + (-2, -1) = \left(\frac{2}{3}, -2\right) + (-2, -1) = \left(-\frac{4}{3}, -3\right)$

$\vec{a} \cdot \vec{b} = \left(\frac{4}{3}, 1\right) \cdot \left(-\frac{3}{2}, \frac{1}{2}\right) = -\frac{3}{2} + \frac{1}{2} = -1$

c) $\vec{AB} \cdot (\vec{a} + \vec{b}) = \vec{AB} \cdot ((-4, 3) + (0, 8)) = \vec{AB} \cdot (-4, 11)$

$\vec{AB} \cdot (-1(0, 8)) = \vec{AB} \cdot (0, -8) = (1, -3) \cdot (0, -8) = 24$

d) $3(-4, 3) - 2(4, 5) \cdot (3(1, -3) + 2(-2, -1) - 2(-1, 2))$

$((-12, 9) - (8, 10)) \cdot ((3, -9) + (-4, -2) - (-2, 4))$

$(-20, -1) \cdot (-1, 7) = 20 - 7 = 13$

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e) $\vec{u} = (2, 3)$ $\vec{v} = (1, -3)$

$|\vec{u} + \vec{v}| = 5$

a) $\vec{OA} \cdot \vec{OB} = (3 - 2, -3 - 3) = (1, -6)$

$|\vec{OA}| = \sqrt{1^2 + (-6)^2} = \sqrt{37}$

b) $|\vec{u}| + |\vec{v}| = \sqrt{2^2 + 3^2} + \sqrt{1^2 + (-3)^2} = \sqrt{13} + \sqrt{10}$

$\sqrt{13} + \sqrt{10} = \sqrt{13 + 10} = \sqrt{23}$

c) $\cos \theta = \frac{\vec{u} \cdot \vec{v}}{|\vec{u}| \cdot |\vec{v}|} = \frac{(2, 3) \cdot (1, -3)}{\sqrt{13} \cdot \sqrt{10}} = \frac{2 - 9}{\sqrt{130}} = \frac{-7}{\sqrt{130}}$

$\frac{3}{4} = \frac{3^2 + 9^2 - 184}{2 \cdot \sqrt{13} \cdot \sqrt{10}}$

$3(1 + 4^2) = 9 + 9 \cdot 4^2 - 184$

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$3 \cdot 17 = 9 + 144 - 184$

$51 = 135 - 184$

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$$c) \vec{u} \perp (-3, 2) \rightarrow$$

$$|\vec{u}| = \sqrt{6^2 + 2^2} = \sqrt{9+4} = \sqrt{13}$$

$$\left(-\frac{3}{\sqrt{13}}, \frac{2}{\sqrt{13}}\right) \cdot 13 = \left(-\frac{3}{\sqrt{13}} \cdot 13, \frac{2}{\sqrt{13}} \cdot 13\right) = \left(-\frac{3\sqrt{13}}{13} \cdot 13, \frac{2\sqrt{13}}{13} \cdot 13\right) = (-3\sqrt{13}, 2\sqrt{13}) \text{ ko desplazamodun}$$

$$\vec{v} = (-3\sqrt{13}, 2\sqrt{13})$$

$$3) \text{ (1,45)} \quad d = P_1 - P_0 = (3 - (-2), 3 - 1) = (5, 2)$$

$$+ (0,3) \quad -2y + 4 = 6x - 6 \rightarrow 6x + 2y - 10 = 0 \rightarrow 2y + 2 = 0$$

$$S: \frac{x-0}{5} = \frac{y-5}{2} \rightarrow 5y - 5 = 2x$$

$$y = 5 \leftarrow (0,5)$$

$$\text{para } 2x - 5y + 5 = 0$$

$$2x - 5y + c' = 0$$

$$-4 = 5 + c' = 0$$

$$c' = 9$$

$$6 - 15 + c' = 0$$

$$-9 + c' = 9$$

$$c' = 9$$

$$2x - 5y + 9 = 0$$

explicita: $y = \frac{2}{5}x + 9$

$$b) (0,4)$$

$$\pi(P_1, P_2) = \left(\frac{-2+3}{2}, \frac{1+3}{2}\right) = \left(\frac{1}{2}, 2\right) \checkmark$$

$$d(\pi, t)$$

$$t: 6x + 2y - 2 = 0 \rightarrow \frac{|Ax_0 + By_0 + c|}{\sqrt{A^2 + B^2}} = \frac{|6 \cdot \frac{1}{2} + 2 \cdot 2 - 2|}{\sqrt{6^2 + 2^2}}$$

$$> \frac{|3+4-2|}{\sqrt{36+4}} = \frac{5}{\sqrt{40}} = \frac{5}{\sqrt{40}} \cdot \frac{\sqrt{40}}{\sqrt{40}} = \frac{5\sqrt{40}}{40}$$

$$\frac{5 \cdot \sqrt{2^3 \cdot 5}}{40} = \frac{5\sqrt{10}}{8} = \frac{\sqrt{10}}{4} \cdot \frac{3}{2\sqrt{10}} = \frac{3\sqrt{10}}{20}$$



EKINTZA

3c) (0,75)

Erdik: $y = x$

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data 24/12/04

$$y - x = 0$$

$$\vec{d} = (1, 1) \rightarrow m = 1$$

$$2x - 5y + 9 = 0$$

$$\vec{d} = (5, 2) \rightarrow m = \left(\frac{2}{5}\right)$$

$m_e \neq m_r \Rightarrow$ ez bakoitzu leku.

Zutak? $\vec{d}_e \cdot \vec{d}_r = 0$?

$$(1 \cdot 5 + 2 \cdot 1) = 0?$$

$7 \neq 0 \rightarrow$ ez dira zutak.

Ebakidura P:

$$\begin{cases} y - x = 0 \\ 2x - 5y + 9 = 0 \end{cases} \rightarrow y = x = 3$$

$$\begin{aligned} 2x - 5x + 9 &= 0 \\ -3x &= -9 \\ x &= 3 \end{aligned}$$

(3, 3)

puntu bakoitz en dira.

$$\cos \alpha = \frac{\vec{d}_r \cdot \vec{d}_e}{|\vec{d}_r| |\vec{d}_e|} = \frac{7}{\sqrt{2} \cdot \sqrt{5^2 + 2^2}} = \frac{7}{\sqrt{2} \cdot \sqrt{29}} = \frac{7}{\sqrt{58}}$$

$$\alpha = \arccos\left(\frac{7}{\sqrt{58}}\right)$$

4) (0,8) $r: (0, -1) + (2, -2) \cdot t \rightarrow x = 2t$
 $y = -1 - 2t$

$$\begin{cases} t = \frac{x}{2} \\ t = -\frac{y+1}{2} \end{cases} \rightarrow \frac{x-0}{2} = \frac{y+1}{2} \rightarrow x - 0 = y + 1 \rightarrow x - y - 1 = 0$$

$P_1 \rightarrow x - y - 1 = 0$
 $y = 0 \rightarrow x = 1$
 $(1, 0)$

$$\begin{aligned} 2x + 2y + 2 &= 0 \\ x + y + 1 &= 0 \end{aligned}$$

$P_2 \rightarrow -1 - y - 1 = 0 \rightarrow y = -2$
 $-2 = y \rightarrow (-1, -2)$

$$d(P_1, P_2) = \sqrt{(-1-1)^2 + (-2-0)^2} = \sqrt{8} = 2\sqrt{2}$$

$$|\vec{P}_1 \vec{P}_2| = \sqrt{(-2, 2)} \rightarrow \sqrt{2^2 + (-2)^2} = \sqrt{8} = 2\sqrt{2}$$

b) $M(P_1, P_2) = \left(\frac{(1+(-1))}{2}, \frac{(0+(-2))}{2}\right) = (0, -1)$

(0,4)

$$L: \frac{x-0}{2} = \frac{y+1}{2} \rightarrow x - 0 = y + 1 \rightarrow x - y - 1 = 0$$

$$x - y - 1 = 0$$

5) $\vec{a} = (6, -6) = (1, -1)$

$$h: \frac{x-0}{1} = \frac{y-6}{-1}$$

$$d(h, h') = \frac{1}{\sqrt{2}}$$

$$\frac{y-6}{-4} = \frac{-x}{1} \quad \text{---}$$

$$x + y - 6 = 0$$

(9,25)

$(0, 1)$

$$\frac{1}{\sqrt{2}} d(h, h') = \frac{|A x_0 + B y_0 + C|}{\sqrt{A^2 + B^2}} = \frac{|1 \cdot x_0 + 1 \cdot y_0 + C|}{\sqrt{2}} = \frac{1}{\sqrt{2}}$$

$d(h, h') =$
 $= d(1, h')$
 $= d(19, h')$

$C = -5$
 $C = -1$

$x + y - 5 = 0$

$$\frac{\sqrt{2}}{\sqrt{2}} = \frac{d(9, h')}{x + y + 0}$$

$$x + y + (c^1 - 1) = 0 \rightarrow (\lambda = 0)$$

$$y + (-x + 1) - 1 = 0$$

$$4 - x = 0$$

$$f = x$$

$$\{y + c' - 1 = 0$$

$$\begin{cases} y + c' - 1 = 0 \\ x + (c' - 1) = 0 \end{cases}$$

$$y = 0$$

$$y=0 \quad A \left\{ \begin{array}{l} x=1 \\ k_1 \end{array} \right. \quad B \left\{ \begin{array}{l} y=1 \\ k_2 \end{array} \right.$$

$C'(4,1); A'(1,4); B'(4,1)$

c) $O: d(C', B') = 3$
 $H: d(C', A') = 3 \} A = \frac{9}{2} \text{ uL}$

~~$$\begin{cases} y+1-x=0 & y+1-y=0 \\ y-x=0 & \rightarrow x=y \end{cases}$$~~

$$(x^2 + 2x) + (7^2 - 64) = 6$$

$$(x+1)^2 - 1 + (y-3) - 9 = 6$$

$$(x+1)^2 + (y-5)^2 = 16$$

ekualo laburta
← p^2

$$6(0.62)^2 + 2y^2 + 4x - 12y - 12 = 0$$

$$a) \frac{1}{2} (x^2 + y^2 + 2x - 6y - 6) = 0$$

Centro?
Radio?

$x^2 + y^2 + 2x - 6y - 6 = 0$
 $C(-1, 3) \quad r = 4$

$$C(-1, 3) \quad r = 4$$

$$b) (x+1)^2 + (y-3)^2 =$$

(6,15)

$$d(r_+, c) = r = \sqrt{5}$$

$$x^2 + y^2 + 2x - 6y + 5 = 0$$

$$7) (0,85)$$

Zentrum $(0, 2)$ ✓ Punkt: $P(-8, 8)$ $Q(8, 8)$

a) $(x)^2 + (y-2)^2 = d(c, p)^2$

$$(-8, 6) \rightarrow |\vec{v}| = \sqrt{64 + 36}$$

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$$\underline{1x^2 + (4-2)^2 = 10^2}$$

\checkmark b) $d = (-8, 6) \in C$

$$\frac{x}{-8} = \frac{y-2}{6} \rightarrow -8y + 16 = 6x$$

$$6x + 8y - 16 = 0$$

$$2(3x + 4y - 8) = 0$$

$$\rightarrow 3x + 4y - 8 = 0$$

" +56" $\vec{d} = (+4, 3)$

$$\vec{d} = (3, 4)$$

\hookrightarrow 2.2 cm Tangente $4x - 34 - 8 = 0$