

Adı- Soyadı:

Numara:

MAT204 ANALİTİK GEOMETRİ I DERSİ ARA SINAVI

Soru 1) Aşağıdaki noktaların yerlerini belirleyiniz.

a) $P = (2, -3, -1) \in \mathbb{R}^3$

b) $Q = (0, 4, 3) \in \mathbb{R}^3$

c) $K = (-3, 0, 3) \in \mathbb{R}^3$ $(1, 2, 3)$

Soru 2) Düzlemde kutupsal koordinat sisteminde aşağıdaki noktaların yerlerini belirleyiniz.

$A = (5, 30), B = (-5, 30), C = (-5, -30), D = (5, -30),$

$E = (0, 30), F = (-5, \pi), G = (5, 210)$

Soru 3) Kartezyen koordinatlarda verilen $P = (-2, 2, 3)$ noktasının silindirik koordinatlardaki karşılığını bulunuz.

Soru 4) $d_1, \dots, \left\{ \begin{array}{l} \frac{x-2}{3} = \frac{y-1}{2} = z = \lambda_1 \end{array} \right.$ doğrularının birbirine göre durumlarını inceleyiniz.

$d_2, \dots, \left\{ \begin{array}{l} \frac{x}{1} = \frac{y+3}{2} = \frac{z-1}{3} = \lambda_2 \end{array} \right.$

Soru 5) Uzayda $A(1, 0, -2)$ noktasından geçen ve

$d_1, \dots, \left\{ \begin{array}{l} x = 1 - 2t \\ y = -1 + t \\ z = t \end{array} \right.$ ve $d_2, \dots, \left\{ \begin{array}{l} \frac{x}{-1} = \frac{y-3}{2} = \frac{z-1}{2} = \lambda \end{array} \right.$

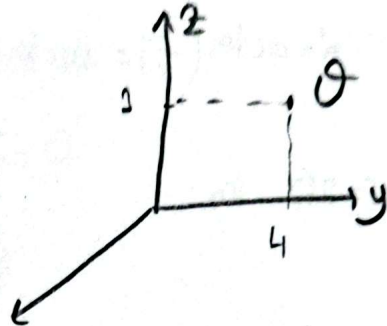
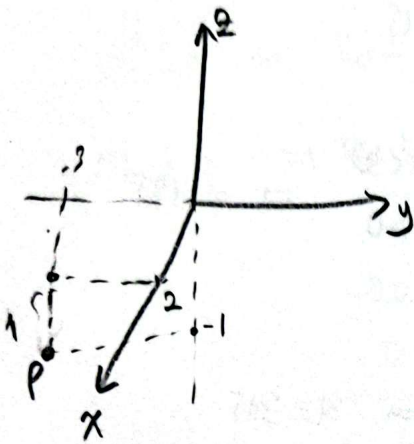
doğrularını dik kesen d doğrusunu bulunuz.

Prof. Dr. Emin KASAP

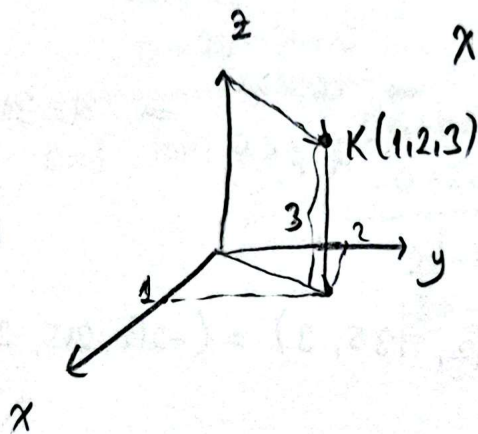
MAT204 Analitik Geom I Ara Soru
Cevap Anahtarı

SORU 1) $P(2, -3, -1)$

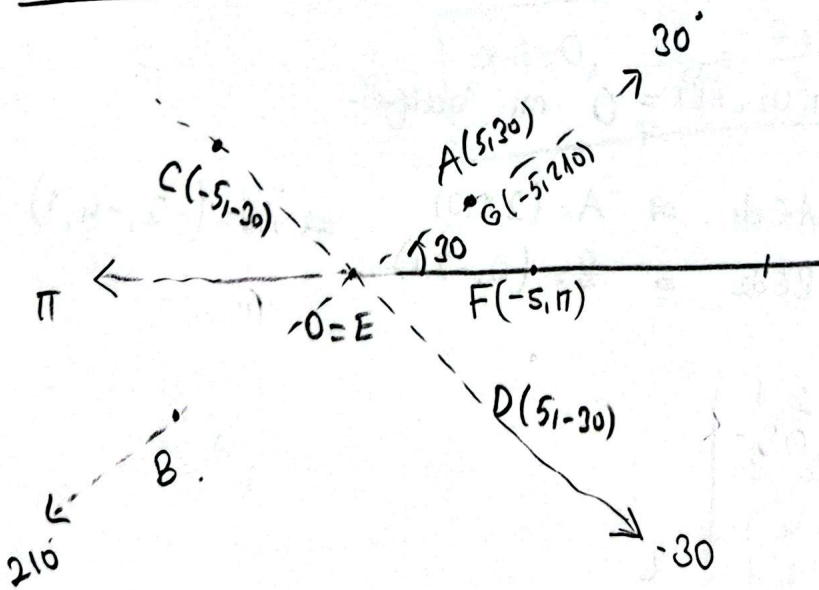
$\theta = (0, 4, 3)$



$K(1, 2, 3)$



SORU 2



SORU 3) $P(-2, 2, 3)$

$$x = -2 \quad y = 2 \quad z = 3$$

$$r = \pm \sqrt{x^2 + y^2} = \pm \sqrt{4 + 4} = \pm 2\sqrt{2}$$

$$\alpha = \arctan\left(\frac{y}{x}\right) = \arctan(-1) \Rightarrow \alpha = 135, 315$$

$r = 2\sqrt{2}$ için

$$\begin{aligned} \bar{x} &= \overset{+}{r} \overset{+}{\cos\alpha} & \Rightarrow \cos\alpha < 0 \\ \bar{y} &= \overset{+}{r} \overset{+}{\sin\alpha} & \Rightarrow \sin\alpha > 0 \Rightarrow \alpha = 135 \end{aligned}$$

$r = -2\sqrt{2}$ için

$$\begin{aligned} \bar{x} &= \overset{-}{r} \overset{+}{\cos\alpha} & \Rightarrow \cos\alpha > 0 \\ \bar{y} &= \overset{-}{r} \overset{-}{\sin\alpha} & \Rightarrow \sin\alpha < 0 \Rightarrow \alpha = 315 \end{aligned}$$

0 halinde

$$P(r, \alpha, z) = (2\sqrt{2}, 135, 3) = (-2\sqrt{2}, 315, 3)$$

SORU 4)

$$u_1 = (3, 2, 1)$$

$$u_2 = (1, 2, 3)$$

$$u_1 \neq u_2 \Rightarrow \det(u_1, u_2, \overline{AB}) \neq 0 \text{ mi inceleysel.}$$

Döğruler ya
tek noktada keşir
ya da aykındır

$$A \in d_1 \Rightarrow A = (2, 1, 0)$$

$$B \in d_2 \Rightarrow B = (0, -3, 1)$$

$$\Rightarrow \overline{AB} = (-2, -4, 1)$$

$$\det(u_1, u_2, \overline{AB}) = \begin{vmatrix} 3 & 2 & 1 \\ 1 & 2 & 3 \\ -2 & -4 & 1 \end{vmatrix}$$

$$\begin{array}{r} -4 \\ -06 \\ +2 \\ \hline -38 \end{array} \quad \begin{array}{r} 6 \\ -4 \\ -12 \\ \hline -10 \end{array}$$

$$-10 + 38 = 28 \neq 0 \text{ O halde döğruler aykındır.}$$

SORUS)

$$u_1 = (-2, 1, 1)$$

$$u_2 = (-1, 2, 2)$$

$$d \dots \frac{x-1}{a} = \frac{y}{b} = \frac{z+2}{c} = \lambda \quad u_d = (a, b, c)$$

$$d_1 \perp d \Rightarrow u_d \perp u_1 \Rightarrow \langle u_d, u_1 \rangle = 0$$

$$d_2 \perp d \Rightarrow u_d \perp u_2 \Rightarrow \langle u_d, u_2 \rangle = 0$$

$$-2a + b + c = 0$$

$$-a + 2b + 2c = 0$$

$c=1$ için

$$\begin{array}{r} -2a + b = -1 \\ -2 \quad \times \\ \hline -a + 2b = -2 \end{array}$$

$$\begin{array}{r} -2a + b = -1 \\ +2a - 4b = +4 \\ \hline \end{array}$$

$$-3b = 3 \quad \boxed{b = -1} \quad \boxed{a = 0}$$

0 halde

$$u_d = (0, -1, 1) \quad \text{olur}$$

$$d \dots \boxed{x-1=0, \quad \frac{y}{-1} = \frac{z+2}{1} = \lambda}$$