Exam in LAAG 1 part.

1.Find the determinant

$$\Delta = \begin{vmatrix} 3 & -3 & 2 & -2 \\ 3 & 0 & 2 & 4 \\ 3 & 4 & 1 & 6 \\ 12 & 2 & 4 & 7 \end{vmatrix}.$$ **(3p.)**

2. Given the points : $A(2;-1;2), B(-2;1;2),$ $C(3;-2;3), D(1;0;1)$. Find:

a) area of ΔBCD and $\cos\measuredangle BAD$; (2p.)

b) equation of a plane α, such that the straight line $(AB)\subset\alpha$ and $\alpha \parallel \overrightarrow{CD}$.(1p.)

3. Given the points : $A(3;0), B(0;5)$ and the straight line $g: 2x+y=0$. Find:

a) coordinates of a point $C\in g$ such that ΔABC is a rectangular with $\measuredangle B = 90^0$.(2p.)

b) equation of the outside circle of a ΔAOB, where p. $O(0;0)$ is the origin.

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1. Using the Gauss method, solve the following system of equations and check the result

$$\begin{cases} 3x_1 - x_2 + x_3 = 6 \\ -2x_1 + 3x_2 + x_3 = 0 \\ x_1 - 4x_2 - x_3 = -3 \end{cases}$$ (3p.)

2. Given the p. $A(0;-1;3), B(2;1;-2), C(0;3;1), D(-1;5;3)$. Find:

a) volume of the piramid $ABCD$ and $\cos\measuredangle CAB$.; (2p.)

b) equation of the straight line g passing through the p. D and parallel to the vector $\overrightarrow{AB}$. (1p.)

3. Given the straight line $g: 3x+4y-12=0$.Find:

a) coordinates of vertexes of a isosceles triangle, with a base AB, lying on the Ox, if it is known that the side BC coinsides with the segment, which g cuts from the coordinate axeses.(2p.)

b) equation of the outside circle of a ΔBOC, where p. $O(0;0)$ is the origin. (1p.)

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To pass successfully this part you need at least 4 points! You have 75 minutes!

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Exam in LAAG ,18.01. 2018, var. 1
Examiner: assoc. proff. Ivan Dimitrov

Student:_ _, fac. №: __ _ _ _.

Answer the following questions and solve the given problems .

1.Give definition of eigen values and eigen vectors of a matrix. (2p.) Find the eigen values and eigen vectors of matrix $A = \begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}$. **(2p.)**

2. Give definition of a scalar product of two vectors. (2p) Find the value of a parameter λ , if it is known that the angle between the vectors $\vec{a} = [\lambda/2, 0, -3]$ and $\vec{b} = [2, -1, 1]$ is $\varphi = 30^0$.(2p.)

3. Given the curve; $2x^2 + by^2 + 4x - 8y - 4 = 0$ with respect to Cartezian coordinate system in he plane. Find he value of b if it known that the curve is a circle. (2p.) Find the center and the radius of this circle as well the intersecting points with coordinate lines. (2p)

You have 75 minutes!
To pass the second part you need min. 5p. To pass the exam successfully you need min 10p.
If Σ_1 is a sum of your points from the first part and Σ_2 is your points from the second part than if your total score $\Sigma = \Sigma_1 + \Sigma_2 < 10p.$ you get Poor(2). If $\Sigma = 10, 11, 12$ p. you get (3); if $\Sigma = 13, 14, 15$ you get (4); if $\Sigma = 16, 17, 18$ you get (5); if $\Sigma = 19, 20, 21$ you get (6).

$\Sigma =$ **Mark :** **Signature:**

/I. Dimitrov/

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Exam in LAAG ,18.01. 2019, var. 1
Examiner: assoc. proff. Ivan Dimitrov

Student:_ _, fac. №: __ _ _ _.

Answer the following questions and solve the given problems .

1.Give definition of eigen values and eigen vectors of a matrix. Find the eigen values and eigen vectors of matrix $A=\begin{bmatrix} 2 & -1 \\ -1 & 2 \end{bmatrix}$.

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