Simulare județeană - Examenul național de bacalaureat, Decembrie 2024
Proba E.c)
Matematică *M_pedagogic*
Barem de evaluare și de notare

Varianta 2

Filiera vocațională, profilul pedagogic, specializarea învățător-educatoare

SUBIECTUL I **(30 puncte)**

5p	1. $\left(\sqrt{8}+1\right)\left(2\sqrt{2}-1\right)-\sqrt{36}=\left(2\sqrt{2}\right)^2-1^2-6$ a. $=8-1-6=1.$	**3p** **2p**
5p	2. $\begin{cases}y=f(x)\\y=g(x)\end{cases}\Rightarrow f(x)=g(x)\Leftrightarrow 5x-1=5+2x$ $3x=6y\Rightarrow x=2\Rightarrow f(2)=9\Rightarrow P(2,9).$	**2p** **3p**
5p	3. $\left.\begin{array}{l}x^2+6x\geq 0\Rightarrow x\in(-\infty;-6]\cup[0;+\infty)\\ x\geq 0\Rightarrow x\in[0;+\infty)\end{array}\right\}\Rightarrow x\in[0;+\infty)$ $\left(\sqrt{x^2+6x}\right)^2=x^2\Leftrightarrow x^2+6x=x^2\Rightarrow x=0\in[0;+\infty)$.	**2p** **3p**
5p	4. $x-$ prețul inițial: $x-\frac{10}{100}x=540\Rightarrow x-\frac{x}{10}=540$ $10x-x=5400\Rightarrow 9x=5400\Rightarrow x=600$ lei.	**3p** **2p**
5p	1. $x_A=\frac{x_B+x_C}{2}\Rightarrow x_C=1;\ y_A=\frac{y_B+y_C}{2}\Rightarrow y_C=-2\Rightarrow C(1,-2)$ $AO=CO=\sqrt{5}\Rightarrow \Delta AOC\ isoscel$ $AC=\sqrt{10};\ AC^2=AO^2+CO^2\Rightarrow \Delta AOC\ dreptunghic.$	**2p** **3p**
5p	2. $AC=l\sqrt{2}\Rightarrow l=2$ $P=4l\Rightarrow P=8.$	**3p** **2p**

SUBIECTUL al II-lea **(30 puncte)**

5p	**1.** $(-2)*2=2\cdot(-2)\cdot 2-4\cdot(-2)-4\cdot 2+7=$ $=-8+8-8+7=-1.$	**3p** **2p**
5p	**2.** $y*\mathrm{x}=2yx-4y-4x+7=$ $=2xy-4x-4y+7=x*y\Rightarrow$ legea de compoziție " $*$ " este comutativă.	**2p** **3p**
5p	**3.** $x*\mathrm{y}=2xy-4x-4y+8-1=2x(y-2)-4(y-2)-1=$ $=(y-2)(2x-4)-1=2(x-2)(y-2)-1$	**3p** **2p**
5p	**4.** $(x+1)*x=2(x+1-2)(x-2)-1=3\Leftrightarrow 2x^2-4x-2x+4-1=3$ $2x^2-6x=0\Rightarrow x_1=0,x_2=3.$	**3p** **2p**
5p	**5.** $4^x*2^x=-1\Rightarrow 2(2^{2x}-2)(2^x-2)=0$ $2^{2x}-2=0\Rightarrow x=\frac{1}{2}$ $2^x-2=0\Rightarrow x=1.$	**2p** **3p**
5p	**6.** $2\cdot\frac{1}{x}\cdot x-4\cdot\frac{1}{x}-4x-7\leq -1\Rightarrow -2x^2+5x-2\leq 0$ $x\in\left(0,\frac{1}{2}\right]\cup[2,+\infty)$	**3p** **2p**

SUBIECTUL al III-lea **(30 puncte)**

5p	**1.** $detA=\begin{vmatrix}5&4\\4&5\end{vmatrix}=5\cdot 5-4\cdot 4=$ $=25-16=9.$	**3p** **2p**
5p	**2.** $\left[\begin{pmatrix}5&4\\4&5\end{pmatrix}-\begin{pmatrix}1&0\\0&1\end{pmatrix}\right]\left[\begin{pmatrix}5&4\\4&5\end{pmatrix}-\begin{pmatrix}9&0\\0&9\end{pmatrix}\right]=\begin{pmatrix}4&4\\4&4\end{pmatrix}\begin{pmatrix}-4&4\\4&-4\end{pmatrix}=$ $=\begin{pmatrix}-16+16&16-16\\-16+16&16-16\end{pmatrix}=O_2.$	**3p** **2p**
5p	**3.** $B=\begin{pmatrix}5&4\\4&5\end{pmatrix}-\begin{pmatrix}5&0\\0&5\end{pmatrix}=\begin{pmatrix}0&4\\4&0\end{pmatrix}$ $B\cdot B=\begin{pmatrix}16&0\\0&16\end{pmatrix}\Rightarrow S=32:2^5.$	**2p** **3p**
5p	**4.** $aA-I_2=\begin{pmatrix}5a-1&4a\\4a&5a-1\end{pmatrix}$ $\begin{vmatrix}5a-1&4a\\4a&5a-1\end{vmatrix}=0\Rightarrow 9a^2-10a+1=0\Rightarrow x_1=1,x_2=\frac{1}{9}.$	**2p** **3p**

5p	**5.** $\begin{pmatrix}5 & 4\\ 4 & 5\end{pmatrix}\cdot\begin{pmatrix}x & 1\\ y & 2\end{pmatrix}=\begin{pmatrix}x & 1\\ y & 2\end{pmatrix}\cdot\begin{pmatrix}5 & 4\\ 4 & 5\end{pmatrix}\Leftrightarrow\begin{pmatrix}5x+4y & 5+8\\ 4x+5y & 4+10\end{pmatrix}=\begin{pmatrix}5x+4 & 4x+5\\ 5y+8 & 4y+10\end{pmatrix}$ $x=2; y=1.$	**3p** **2p**
5p	**6.** $A+xI_2=\begin{pmatrix}5+x & 4\\ 4 & 5+x\end{pmatrix}; A-xI_2=\begin{pmatrix}5-x & 4\\ 4 & 5-x\end{pmatrix}$ $\begin{vmatrix}5+x & 4\\ 4 & 5+x\end{vmatrix}+\begin{vmatrix}5-x & 4\\ 4 & 5-x\end{vmatrix}\geq 18\Rightarrow 2x^2+18\geq 18\Rightarrow 2x^2\geq 0$ adevărat $\forall x\in\mathbb{R}$.	**2p** **3p**