**Examenul național de bacalaureat 2026**
**Proba E. c)**
**Matematică *M_pedagogic***
**BAREM DE EVALUARE ȘI NOTARE**

**Simulare**

***Filiera vocaţională, profilul pedagogic, specializarea învăţător-educatoare***

**• Pentru orice soluţie corectă, chiar dacă este diferită de cea din barem, se acordă punctajul corespunzător.**
**• Nu se acordă fracţiuni de punct, dar se pot acorda punctaje intermediare pentru rezolvări parţiale, în limitele punctajului indicat în barem.**
**• Se acordă zece puncte din oficiu. Nota finală se calculează prin împărţirea la zece a punctajului total acordat pentru lucrare.**

**SUBIECTUL I** **(30 de puncte)**

| | | |
|---|---|---|
| **1.** | $\left[\left(\frac{5}{22}+\frac{2}{11}\right)\cdot\frac{11}{3}+1\right]:2{,}5=\left(\frac{9}{22}\cdot\frac{11}{3}+1\right):\frac{25}{10}=$<br>$=\frac{5}{2}\cdot\frac{2}{5}=1$ | **2p**<br>**3p** |
| **2.** | $f(3)=0$<br>$P=f(-7)\cdot f(-6)\cdot\cdots\cdot f(3)\cdot f(4)\cdot f(5)\cdot f(6)\cdot f(7)=0$ | **3p**<br>**2p** |
| **3.** | $\left(\frac{1}{2}\right)^x=2^{x-2}\Leftrightarrow 2^{-x}=2^{x-2}\Leftrightarrow$<br>$\Leftrightarrow -x=x-2\Leftrightarrow x=1$ | **3p**<br>**2p** |
| **4.** | $750+\frac{10}{100}\cdot 750=825$ lei (prețul bicicletei după scumpirea de 10%)<br>$825-\frac{5}{100}\cdot 825=783{,}75$ lei (prețul final) | **2p**<br>**3p** |
| **5.** | $\text{AB}=\sqrt{10},\ AC=2\sqrt{10},\ BC=5\sqrt{2}$<br>$\sqrt{10}^2+\left(2\sqrt{10}\right)^2=\left(5\sqrt{2}\right)^2\overset{R.T.P}{\Longrightarrow}\Delta ABC$ – dreptunghic în $A$<br>$\mathcal{A}_{\Delta ABC}=\frac{AB\cdot AC}{2}=\frac{\sqrt{10}\cdot 2\sqrt{10}}{2}=10$ | **2p**<br>**1p**<br>**2p** |
| **6.** | $\frac{1+\sin 60^o}{\cos 60^o}-\frac{1}{\text{tg}\,30^o}=\frac{1+\frac{\sqrt{3}}{2}}{\frac{1}{2}}-\frac{1}{\frac{1}{\sqrt{3}}}=$<br>$=2+\sqrt{3}-\sqrt{3}=2$ | **3p**<br>**2p** |

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

| | | |
|---|---|---|
| **1.** | $1*(-1)=1\cdot(-1)+3\cdot 1+3\cdot(-1)+6=$<br>$=-1+3-3+6=5$ | **2p**<br>**3p** |
| **2.** | $x*y=xy+3x+3y+6\Leftrightarrow x*y=x(y+3)+3(y+3)-3\Leftrightarrow$<br>$\Leftrightarrow x*y=(x+3)(y+3)-3$ | **3p**<br>**2p** |
| **3.** | $(x*y)*z=[(x+3)(y+3)-3\,]*z=(x+3)(y+3)(z+3)-3$<br>$x*(y*z)=x*[(y+3)(z+3)-3]=(x+3)(y+3)(z+3)-3=(x*y)*z$, pentru orice numere reale $x$, $y$ și $z$, deci legea de compoziție „$*$” este asociativă. | **2p**<br>**3p** |
| **4.** | $x*(-3)=(x+3)(-3+3)-3=(x+3)\cdot 0-3=-3$<br>$(-3)*x=(-3+3)(x+3)-3=0\cdot(x+3)-3=-3$, deci $x*(-3)=(-3)*x=-3$, pentru orice număr real $x$. | **2p**<br>**3p** |
| **5.** | $x*x=6\Leftrightarrow(x+3)^2-3=6\Leftrightarrow(x+3)^2=9\Leftrightarrow$ | **3p** |

| | | |
|---|---|---|
| | $\Leftrightarrow x+3=\pm 3$, deci $x\in\{-6,0\}$ | **2p** |
| **6.** | $\left(-\sqrt{13}\right)*\left(-\sqrt{12}\right)*\cdots*\sqrt{12}*\sqrt{13}=\left\{\left[\left(-\sqrt{13}\right)*\cdots*\left(-\sqrt{10}\right)\right]*\left(-\sqrt{9}\right)\right\}*\left[\left(-\sqrt{8}\right)*\cdots*\sqrt{13}\right]=$<br>$(-3)*\left[\left(-\sqrt{8}\right)*\cdots*\sqrt{13}\right]=-3$ | **3p**<br>**2p** |

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

| | | |
|---|---|---|
| **1.** | $A^2=\begin{pmatrix}2 & 4\\ -1 & -2\end{pmatrix}\cdot\begin{pmatrix}2 & 4\\ -1 & -2\end{pmatrix}=\begin{pmatrix}2\cdot 2+4\cdot(-1) & 2\cdot 4+4\cdot(-2)\\ -1\cdot 2+(-2)\cdot(-1) & -1\cdot 4+(-2)\cdot(-2)\end{pmatrix}=$<br>$=\begin{pmatrix}4-4 & 8-8\\ -2+2 & -4+4\end{pmatrix}=\begin{pmatrix}0 & 0\\ 0 & 0\end{pmatrix}=O_2$ | **3p**<br>**2p** |
| **2.** | $[M(2)]^2=\begin{pmatrix}2 & -1\\ -1 & 2\end{pmatrix}\cdot\begin{pmatrix}2 & -1\\ -1 & 2\end{pmatrix}=\begin{pmatrix}5 & -4\\ -4 & 5\end{pmatrix}$<br>$[M(2)]^3=[M(2)]^2\cdot M(2)=\begin{pmatrix}5 & -4\\ -4 & 5\end{pmatrix}\cdot\begin{pmatrix}2 & -1\\ -1 & 2\end{pmatrix}=\begin{pmatrix}14 & -13\\ -13 & 14\end{pmatrix}$<br>$[M(2)]^3-2[M(2)]^2+3I_2=\begin{pmatrix}14 & -13\\ -13 & 14\end{pmatrix}-\begin{pmatrix}10 & -8\\ -8 & 10\end{pmatrix}+\begin{pmatrix}3 & 0\\ 0 & 3\end{pmatrix}=\begin{pmatrix}7 & -5\\ -5 & 7\end{pmatrix}$ | **2p**<br>**3p** |
| **3.** | $M(x)\cdot\begin{pmatrix}1\\ 3\end{pmatrix}=\begin{pmatrix}-1\\ 5\end{pmatrix}\Leftrightarrow\begin{pmatrix}x & 1-x\\ 1-x & x\end{pmatrix}\cdot\begin{pmatrix}1\\ 3\end{pmatrix}=\begin{pmatrix}-1\\ 5\end{pmatrix}\Leftrightarrow\begin{pmatrix}3-2x\\ 1+2x\end{pmatrix}=\begin{pmatrix}-1\\ 5\end{pmatrix}\Leftrightarrow$<br>$\Leftrightarrow 2x=4\Leftrightarrow x=2$ | **3p**<br>**2p** |
| **4.** | $A\cdot M(x)=\begin{pmatrix}6 & 0\\ -3 & 0\end{pmatrix}\Leftrightarrow\begin{pmatrix}2 & 4\\ -1 & -2\end{pmatrix}\cdot\begin{pmatrix}x & 1-x\\ 1-x & x\end{pmatrix}=\begin{pmatrix}6 & 0\\ -3 & 0\end{pmatrix}\Leftrightarrow\begin{pmatrix}4-2x & 2+2x\\ x-2 & -1-x\end{pmatrix}=\begin{pmatrix}6 & 0\\ -3 & 0\end{pmatrix}\Leftrightarrow$<br>$\Leftrightarrow x=-1$ | **3p**<br>**2p** |
| **5.** | $M(x)\cdot M(-x)=\begin{pmatrix}x & 1-x\\ 1-x & x\end{pmatrix}\cdot\begin{pmatrix}-x & 1+x\\ 1+x & -x\end{pmatrix}=\begin{pmatrix}-x^2+(1-x)(1+x) & x(1+x)-(1-x)x\\ -(1-x)x+x(1+x) & (1-x)(1+x)-x^2\end{pmatrix}=$<br>$=\begin{pmatrix}1-2x^2 & 2x^2\\ 2x^2 & 1-2x^2\end{pmatrix}$ | **3p**<br>**2p** |
| **6.** | $M(1)+M(2)+\cdots+M(n)=\begin{pmatrix}45 & -36\\ -36 & 45\end{pmatrix}\Leftrightarrow\begin{pmatrix}1 & 0\\ 0 & 1\end{pmatrix}+\begin{pmatrix}2 & -1\\ -1 & 2\end{pmatrix}+\cdots+\begin{pmatrix}n & 1-n\\ 1-n & n\end{pmatrix}=$<br>$=\begin{pmatrix}45 & -36\\ -36 & 45\end{pmatrix}\Leftrightarrow\begin{pmatrix}1+2+\cdots+n & n-(1+2+\cdots+n)\\ n-(1+2+\cdots+n) & 1+2+\cdots+n\end{pmatrix}=\begin{pmatrix}45 & -36\\ -36 & 45\end{pmatrix}\Leftrightarrow$<br>$\Leftrightarrow\begin{pmatrix}\frac{n(n+1)}{2} & n-\frac{n(n+1)}{2}\\ n-\frac{n(n+1)}{2} & \frac{n(n+1)}{2}\end{pmatrix}=\begin{pmatrix}45 & -36\\ -36 & 45\end{pmatrix}\Leftrightarrow\begin{pmatrix}n(n+1) & -(n-1)n\\ -(n-1)n & n(n+1)\end{pmatrix}=\begin{pmatrix}90 & -72\\ -72 & 90\end{pmatrix}\Leftrightarrow$<br>$\Leftrightarrow n=9$ | **2p**<br>**3p** |