

Olimpiada Nationala Gazeta Matematica

Clasa a XI-a

* Required

EX

1 point

Sa se afle cate permutari σ de ordin 8 au $\sigma(1), \sigma(2), \sigma(3)$ numere consecutive ordonate crescator.

- ☐ 600
- ☐ 840
- ☐ 720
- ☐ 120

EX

1 point

Determinati a astfel incat $\lim_{x \rightarrow 0} \frac{\sqrt{ax+1} - 1}{x} = 5$.

- ☐ 0
- ☐ 5
- ☐ 10
- ☐ 2,5

EX

1 point

Daca $\det(A) = 2$, unde $A \in M_3(\mathbb{R})$, aflati cat este $\det(5A)$.

- ☐ 3906250
- ☐ 10
- ☐ 32
- ☐ 250

EX

1 point

Intr – un tablou 2×4 se scriu cifrele de la 1 la 8. In cate moduri poate fi completat tabloul astfel incat pe fiecare linie si coloana sa fie un numar par de cifre pare?

- ☐ 3456
- ☐ 6
- ☐ 56
- ☐ 456

EX

1 point

Determinati numarul matricelor cu 4 linii si 6 coloane formate cu elemente din multimea $\{-1, 1\}$, astfel incat produsul elementelor pe fiecare linie si coloana sa fie -1 .

- ☐ 32768
- ☐ 16384
- ☐ 28576
- ☐ 24876

EX

1 point

Un sir are doua subsiruri cu limitele 1, respectiv 2. Ce limita are sirul?

- ☐ 3
- ☐ nu are limita
- ☐ 1
- ☐ 2

EX

1 point

Calculati $\lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{2k+1}{k!}$.

- ☐ 3e-1
- ☐ 2e
- ☐ 0
- ☐ ∞

EX

1 point

Determinati limita sirului $(x_n)_{n \geq 1}$, dat prin relatia de recurenta $x_{n+1} = \frac{1}{2} \cdot \left(x_n + \frac{49}{x_n}\right)$, $\forall n \geq 1$, si $x_1 = 3$.

- ☐ ∞
- ☐ 5
- ☐ 3
- ☐ 7

EX

1 point

Cate puncte de acumulare are multimea \mathbb{Z} ?

- ☐ 0
- ☐ 2
- ☐ 1
- ☐ o infinitate

EX

1 point

Orice sir monoton ...

- ☐ e convergent
- ☐ e marginit
- ☐ are un subsir convergent
- ☐ are limita

EX

1 point

Calculati valoarea determinantului

$$\begin{vmatrix} 1 & 1 & 1 & 1 & 1 \\ 2 & 3 & 4 & 5 & 6 \\ 4 & 9 & 16 & 25 & 36 \\ 8 & 27 & 64 & 125 & 216 \\ 16 & 81 & 256 & 625 & 1296 \end{vmatrix}.$$

- ☐ 720
- ☐ 0
- ☐ 288
- ☐ 120

EX

1 point

Determinati limita sirului dat prin relatia de recurenta

$$x_{n+1} = 2 \cdot x_n + 3 \cdot x_{n-1} - 8, \forall n \geq 1 \text{ si } x_0 = 2, x_1 = 3.$$

- ☐ 8
- ☐ 4
- ☐ ∞
- ☐ 2

EX

1 point

Aflati cate numere naturale de 6 cifre au cifrele patrute perfecte, iar suma oricaror doua cifre alaturate este patrat perfect.

- ☐ 120
- ☐ 144
- ☐ 84
- ☐ 27

EX

1 point

Determinati numarul matricelor patratiche de ordin 2 cu elemente din multimea $\{2, 3, 4\}$.

- ☐ 81
- ☐ 64
- ☐ 12
- ☐ 625

EX

1 point

Calculati $\lim_{n \rightarrow \infty} \sin \left(\pi \sqrt{4n^2 + 6n + 7} \right).$

- ☐ nu exista
- ☐ 1
- ☐ 0
- ☐ -1

EX

1 point

Fie σ o permutare de ordin 6. Calculati $\sum_{i=1}^6 (\sigma(i))^2.$

- ☐ 121
- ☐ 91
- ☐ 275
- ☐ 441

EX

1 point

Calculati $\lim_{n \rightarrow \infty} \left(\frac{1}{2n+1} + \frac{1}{2n+2} + \dots + \frac{1}{6n} \right).$

- ☐ 0,57
- ☐ ln6
- ☐ ∞
- ☐ ln3

EX

1 point

Calculati $\lim_{n \rightarrow \infty} \frac{1^5 + 2^5 + 3^5 + \dots + n^5}{n^6}.$

- ☐ 1/5
- ☐ ∞
- ☐ 1/6
- ☐ 0

EX

1 point

Calculati $\lim_{n \rightarrow \infty} \frac{\sin(n)}{n}.$

- ☐ nu exista
- ☐ 1
- ☐ 0
- ☐ 3,14

EX

1 point

Calculati $\lim_{x \rightarrow 0} \frac{\sqrt{1-x} - \sqrt[3]{1-2x}}{x}$.

- ☐ ∞
- ☐ $1/2$
- ☐ $1/6$
- ☐ $2/3$

Numele si prenumele *

Your answer

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