OLIMPIADA DE MATEMATICĂ - etapa locală - Clasa a VI- a

Barem de evaluare şi notare

CLASA a VI-a

Problema 1.

a) $A=3^{2n+3}\cdot 2^{4n+6}-2^{2n+1}\cdot 2^{2n+3}\cdot 3^{2n+3}$ 1p

$A=3^{2n+3}\cdot 2^{4n+4}\left(2^2-1\right)$ 1p

Finalizare: $A=3^{2n+4}\cdot 2^{4n+4}=\left(3^{2n+2}\cdot 2^{2n+2}\right)^2$ 2p

b) $2B=2+2^2+2^3+2^4+...+2^{2011}+2^{2012}\Rightarrow B=2^{2012}-1$ 2p

Finalizare: B de forma $M4+3\Rightarrow B$ nu este pătrat perfect 1p

Problema 2.

a) $\dfrac{6}{16\cdot 22},\dfrac{7}{22\cdot 29}$ 2p

b) $S=\dfrac{1}{1\cdot 2}+\dfrac{2}{2\cdot 4}+...+\dfrac{10}{46\cdot 56}=\dfrac{1}{1}-\dfrac{1}{2}+\dfrac{1}{2}-\dfrac{1}{4}-...+\dfrac{1}{46}-\dfrac{1}{56}=1-\dfrac{1}{56}=\dfrac{55}{56}$ 3p

c) $T_{100}=\dfrac{100}{a\cdot b}$ cu $a=b-100$ 1p

$b=1+1+2+3+4+....+100=1+\dfrac{100\cdot 101}{2}=5051$ 1p

Problema 3.

$36\mid\overline{abcd}\Rightarrow 4\mid\overline{abcd}$ şi $9\mid\overline{abcd}$ 1p

Restul este 2 $\Rightarrow d\in\{7,2\}$ 1p

Cum $\overline{abcd}$ divizibil cu 4, obţinem $d=2$ şi $a=6$ 1p

$4\mid\overline{6bc2}\Rightarrow c\in\{1,3,5,7,9\}$ 2p

$9\mid(6+b+c+2)$, deci b va fi respectiv: 0, 7, 5, 3, 1, 9 ....1p

Finalizare: numerele sunt 6012, 6732, 6552, 6372, 6192, 6912 ....1p

Problema 4

a) $m(\sphericalangle BAC)+m(\sphericalangle DAE)=180^0$ 1p

$m(\sphericalangle MAB)+m(\sphericalangle BAE)+m(\sphericalangle EAN)=90^0+\dfrac{m(\sphericalangle BAC)}{2}+\dfrac{m(\sphericalangle EAD)}{2}=180^0$ 1p

$m(\sphericalangle MAN)=180^0$ implică *A, M, N* coliniare 1p

b) $\sphericalangle BAD\equiv\sphericalangle CAE$ 1p

$\triangle ABD\equiv\triangle ACE\Rightarrow[BD]\equiv[CE]$ 1p

c) $[BC]\equiv[ED]\Rightarrow\triangle ABC\equiv\triangle AED\Rightarrow\sphericalangle BAC\equiv\sphericalangle DAE$ 1p

Deoarece $m(\sphericalangle BAC)+m(\sphericalangle DAE)=180^0$ obţinem $m(\sphericalangle BAC)=90^0$ 1p