BAREM DE NOTARE ȘI CORECTARE

Clasa a IX-a

Partea I

1. a); **2.**b);**3.** b; **4.** d); **5.** c)

Partea a II-a

Problema 1

Notam$x = a - 1 \geq 0, y = b - 1 \geq 0,\ z = c - 1 \geq 0$…………………………..4p
Aplicandsuccesivinegalitateamediilorobtinem:
$(x + y + z + 3)^6 \geq \left(3\sqrt[3]{xyz} + 3\right)^6 = 3^6\left(\sqrt[3]{xyz} + 1\right)^6 \geq 3^6\left(2\sqrt[6]{xyz}\right)^6 = 6^6 xyz$…….4p

$\frac{(x+y+z+3)^6}{xyz} \geq 6^6, \qquad \frac{xyz}{(x+y+z+3)^6} \leq \frac{1}{6^6}$………………………………4p
$\frac{(a-1)(b-1)(c-1)}{(a+b+c)^6} \leq \frac{1}{6^6}, \ \frac{abc+a+b+c}{(a+b+c)^6} \leq \frac{1}{6^6}$……………….4p
Cum abc=8
Max E=$\frac{1}{6^6}$…………………………………………………..…….4p
Obs Max E se atinge pentru a=b=c=2

Problema 2

Fie $a \leq b \leq c, atunci,\ m_a \geq m_b \geq m_c, si\ h_a \geq h_b \geq h_c$………4p
Triunghiul medianelor ascutitunghic implica $m_a^2 < m_b^2 + m_c^2$ ...…..4p
$5a^2 > b^2 + c^2$………………….2p
$h_a < h_b + h_c$, deci $\frac{S}{a} < \frac{S}{b} + \frac{S}{c}$ sau $a > \frac{bc}{b+c}$…………………….4p
Este suficient sa arătăm că $\frac{b^2+c^2}{5} \geq \frac{b^2c^2}{(b+c)^2}$
sau $(b^2 + c^2)(b + c)^2 \geq 5b^2c^2$…...4p

Dar $(b^2 + c^2) \geq 2bc$ iar $(b + c)^2 \geq 4bc$……………………..2p
Finalizare…………………………………………………….2p