

**Barem de corectare CMAA 2023 Clasa a X-a – Filiera tehnologică****P1**

$a = \sqrt{\frac{1}{2} \cdot \frac{2}{3} \cdot \frac{3}{4} \cdot \dots \cdot \frac{99}{100}} = \frac{1}{10}$	2p
$b = \frac{1-\sqrt{2}}{-1} + \frac{\sqrt{2}-\sqrt{3}}{-1} + \dots + \frac{\sqrt{120}-\sqrt{121}}{-1} = \frac{1-11}{-1} = 10$	2p
$c = (\sqrt{3} + \sqrt{2}) \cdot (\sqrt{3} - \sqrt{2}) = 1$	2p
$M_g = \sqrt[3]{a \cdot b \cdot c} = 1$	1p

**P2**

a) $z_1 = \frac{2-i}{2+i} + \frac{2+i}{2-i} = \frac{6}{5}$	2p
$\text{Im}(z_1) = 0$	1p
b) $z_{2023} = \left(\frac{2-i}{2+i}\right)^{2023} + \left(\frac{2+i}{2-i}\right)^{2023}$	1p
$\overline{z_{2023}} = z_{2023} \Rightarrow z_{2023} \in R$	3p

**P3**

a) $\log_{30} 30 = \log_{30} (2 \cdot 3 \cdot 5) \Rightarrow 1 = \log_{30} 2 + \log_{30} 3 + \log_{30} 5$	2p
$\log_{30} 3 = 1 - a - b$	1p
b) $\lg 135 = \frac{\log_{30} 135}{\log_{30} 10} = \frac{3\log_{30} 3 + \log_{30} 5}{\log_{30} 2 + \log_{30} 5}$	2p
Finalizare $\lg 135 = \frac{3-3a-2b}{a+b}$	2p

**P4**

a) $t = 20 \Rightarrow f(20) = 123000 \cdot 2^2 = 492000$	3p
b) $f(t) = 98400 \Rightarrow 123000 \cdot 2^{\frac{t}{10}} = 984000$	1p
$2^{\frac{t}{10}} = 8 \Rightarrow \frac{t}{10} = 3 \Rightarrow t = 30$	2p
După 30 de ani	1p