

BAREM DE EVALUARE ȘI DE NOTARE

Varianta 38

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SUBIECTUL I		(30 de puncte)
1.	8	5p
2.	3	5p
3.	- 4	5p
4.	$\frac{1}{4}$	5p
5.	75	5p
6.	6,3	5p
SUBIECTUL II		(30 de puncte)
1.	Desenează prisma dreaptă cu baza triunghi echilateral Notează prisma	4p 1p
2.	$\frac{a}{b} = \frac{2011}{2012} \Leftrightarrow \frac{a}{2011} = \frac{b}{2012} = k \Rightarrow a = 2011k, b = 2012k$ $\frac{2a-b}{b-a} = \frac{2 \cdot 2011k - 2012k}{2012k - 2011k} = \frac{2010k}{k} = 2010$	2p 3p
3.	F echiunitară $\Leftrightarrow 3^{n+2} + 4 \cdot 3^{n+1} + 2 \cdot 3^n + 149 = 2012$ $3^{n+2} + 4 \cdot 3^{n+1} + 2 \cdot 3^n = 1863$ $3^n (3^2 + 4 \cdot 3 + 2) = 1863$ $3^n \cdot 23 = 1863$ $3^n = 81 \Rightarrow n = 4$	1p 1p 1p 1p 1p
4.	a) Reprezentarea corectă a unui punct de pe graficul funcției f	2p

	<p>Reprezentarea corectă a altui punct de pe graficul funcției f</p> <p>Trasarea graficului funcției f</p>	<p>2p</p> <p>1p</p>
	<p>b) $f(n) = 3n + 2$</p> <p>$f(n+2) = 3(n+2) + 2 = 3n + 6 + 2 = 3n + 8$</p> <p>$f(n) \cdot f(n+2) + 9 = (3n+2)(3n+8) + 9 = 9n^2 + 30n + 25$</p> <p>$f(n) \cdot f(n+2) + 9 = (3n+5)^2$ este patrat perfect, $\forall n \in \mathbb{N}$</p>	<p>1p</p> <p>1p</p> <p>2p</p> <p>1p</p>
5	<p>$\left(x + \frac{1}{x}\right)^2 = 25$</p> <p>$x^2 + 2 \cdot x \cdot \frac{1}{x} + \frac{1}{x^2} = 25 \Leftrightarrow x^2 + \frac{1}{x^2} = 23$</p> <p>$\left(x + \frac{1}{x}\right)\left(x^2 + \frac{1}{x^2}\right) = 5 \cdot 23$</p> <p>$x^3 + \frac{x}{x^2} + \frac{x^2}{x} + \frac{1}{x^3} = 115$</p> <p>$x^3 + \frac{1}{x^3} = 115 - 5 \Leftrightarrow x^3 + \frac{1}{x^3} = 110$</p>	<p>1p</p> <p>1p</p> <p>1p</p> <p>1p</p> <p>1p</p>
SUBIECTUL III		(30 de puncte)
1.	<p>a) $V = \frac{h_t}{3} (A_B + A_b + \sqrt{A_B \cdot A_b})$</p> <p>$A_B = L^2 = 20^2 = 400 \text{ cm}^2$</p> <p>$A_b = l^2 = 10^2 = 100 \text{ cm}^2$</p> <p>$V = \frac{30}{3} (400 + 100 + 200) = 10 \cdot 700 = 7000 \text{ cm}^3$</p>	<p>1p</p> <p>1p</p> <p>1p</p> <p>2p</p>

	<p>b)</p> $M'E \perp OM, M'E \cap QN = \{F\}, \triangle M'FN \sim \triangle M'EM \Rightarrow \frac{M'F}{M'E} = \frac{FN}{ME} \Rightarrow FN = \frac{5 \cdot 24}{30} = 4 \text{ cm}$ $QN = QF + FN = 5 + 4 = 9$ $A_{PRST} = ST^2 = 18^2 = 324 \text{ cm}^2$ $V = \frac{24}{3}(100 + 324 + 180) = 4832 \text{ cm}^3$ $V = 4832 \text{ cm}^3 = 4,832 \text{ dm}^3 = 4,832 \text{ litri}$	<p>1p</p> <p>1p</p> <p>1p</p> <p>1p</p> <p>1p</p>
	<p>c) Fie $OL \perp MM'$; $BC \perp OO'$ $OM, OO' \subset (OMM')$</p> $\left. \begin{array}{l} BC \perp OM \\ BC \perp OO' \\ OM, OO' \subset (OMM') \end{array} \right\} \Rightarrow BC \perp (OMM'); \left. \begin{array}{l} BC \perp (OMM') \\ OL \subset (OMM') \end{array} \right\} \Rightarrow BC \perp OL$ $\left. \begin{array}{l} OL \perp MM' \\ OL \perp BC \\ BC, MM' \subset (BCC') \\ BC \cap MM' = \{M\} \end{array} \right\} \Rightarrow OL \perp (BCC') \Rightarrow d(O; (BCC')) = OL$ $A_{\triangle OMM'} = \frac{OM \cdot M'E}{2} = \frac{MM' \cdot OL}{2}$ $OL = \frac{OM \cdot M'E}{MM'} = \frac{10 \cdot 30}{5\sqrt{37}} = \frac{60\sqrt{37}}{37} \text{ cm} \Rightarrow d(O; (BCC')) = \frac{60\sqrt{37}}{37} \text{ cm}$	<p>1p</p> <p>2p</p> <p>1p</p> <p>1p</p>
2.	<p>a) $DE = EC = \frac{DC}{2} = \frac{10}{2} = 5 \text{ cm}$; $\triangle ADE$ și $\triangle BCE$ sunt dreptunghice isoscele</p> $m(\sphericalangle AED) = m(\sphericalangle BEC) = 45^\circ \Rightarrow m(\sphericalangle AEB) = 180^\circ - 45^\circ - 45^\circ = 90^\circ$ $A_{\triangle AEB} = 25 \text{ cm}^2$	<p>2p</p> <p>1p</p> <p>2p</p>
	<p>b) $A_{galben} = A_{disc} - A_{\triangle AEB}$</p> <p>$\triangle ABE$ dreptunghic înscris în cerc $\Rightarrow AB = 2R = 10 \text{ cm} \Rightarrow R = 5 \text{ cm}$</p> $A_{disc} = \pi R^2$	<p>1p</p> <p>1p</p> <p>1p</p> <p>1p</p>

	$A_{disc} = 25\pi$ $A_{galben} = 25\pi - 25 = 25(\pi - 1) \text{ cm}^2$	1p
	<p>c) $A_{albastru} = A_{ABCD} - \frac{A_{disc}}{2}$</p> $A_{ABCD} = L \cdot l = AB \cdot BC = 10 \cdot 5 = 50 \text{ cm}^2$ $A_{albastru} = 50 - \frac{25\pi}{2} = \frac{100 - 25\pi}{2} \text{ cm}^2$ $\pi > 3,14 \Rightarrow -25\pi < -78,5 \Rightarrow 100 - 25\pi < 21,5 \Rightarrow \frac{100 - 25\pi}{2} < 10,75 < 11$	<p>1p</p> <p>1p</p> <p>1p</p> <p>2p</p>