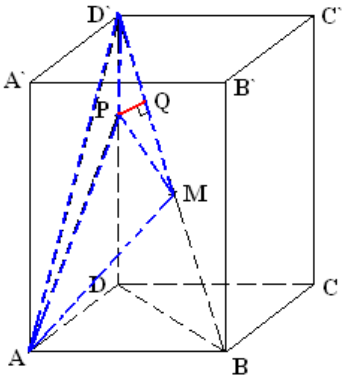


BAREM DE EVALUARE ȘI DE NOTARE

Varianta 14

Prof. Badea Daniela

SUBIECTUL I		(30 de puncte)
1.	-99	5p
2.	-4	5p
3.	20	5p
4.	36	5p
5.	12	5p
6.	50^0	5p
SUBIECTUL II		(30 de puncte)
1.	Desenează tetraedrul Notează tetraedrul	4p 1p
2.	<p>S suma primită; mama îi dă $\frac{2}{3}S + 5$ lei</p> <p>tata îi dă $\frac{60}{100} \cdot \left(\frac{1}{3}S - 5\right) + 3 = \frac{S}{5}$ lei</p> <p>ecuația este $\frac{2}{3}S + 5 + \frac{S}{5} + 25 = S \Leftrightarrow \frac{2S}{15} = 30$</p> <p>$S = 225$ lei.</p>	<p>1p</p> <p>1p</p> <p>2p</p> <p>1p</p>
3.	$\begin{cases} 11x - 2y = 40 \\ 20x - 19y = 42 \end{cases}$ $\begin{cases} x = 4 \\ y = 2 \end{cases}$	<p>3p</p> <p>2p</p>
4.	<p>a) $x \in \mathbb{R} - \{0;1\}$</p> $E(x) = \left[(x+1) : (x-1) - 1 \right] \cdot \frac{x(x-1)}{8}$ $E(x) = \frac{x+1-x+1}{x-1} \cdot \frac{x(x-1)}{8}$ <p>Finalizare</p>	<p>1p</p> <p>2p</p> <p>1p</p> <p>1p</p>
	b) $E(4) + E(4^2) + E(4^3) + \dots + E(4^{2012}) = 1 + 4 + 4^2 + \dots + 4^{2011} = \frac{4^{2012} - 1}{3}$	3p

	$\frac{4 \cdot E(x-1)}{3} = \frac{4}{3} \cdot \frac{x-1}{4} = \frac{x-1}{3}$ $\frac{4^{2012} - 1}{3} = \frac{x-1}{3} \Leftrightarrow x = 4^{2012}$	<p>1p</p> <p>1p</p>
5.	$f: \mathbb{R} \rightarrow \mathbb{R}, f(x) = ax + b$ $G_f \cap Ox = \{A(2, 0)\} \Leftrightarrow f(2) = 0 \Leftrightarrow 2a + b = 0$ $G_f \cap Oy = \{B(0, -6)\} \Leftrightarrow f(0) = -6 \Leftrightarrow b = -6$ $a = 3$ $f(x) = 3x - 6$	<p>1p</p> <p>1p</p> <p>1p</p> <p>1p</p> <p>1p</p>
SUBIECTUL III		(30 de puncte)
1.	<p>a) $d^2 = L^2 + l^2 + h^2 \Leftrightarrow 676 = 64 + 36 + h^2 \Leftrightarrow h = 25$</p> <p>$A_l = 2(Ll + Lh + lh) = 796\text{cm}^2$</p> <p>$V = Llh = 1200\text{cm}^3$</p>	<p>2p</p> <p>2p</p> <p>1p</p>
	<p>b) $PQ \perp D'B, Q \in D'B \Rightarrow d(P, D'B) = PQ$</p> <p>$\frac{D'P}{DP} = \frac{2}{3} \Leftrightarrow \frac{D'P}{D'D} = \frac{2}{5} \Rightarrow D'P = 10\text{cm}$</p> <p>$\Delta D'PQ \sim \Delta D'BD$ (caz I)</p> <p>$\Rightarrow \frac{D'P}{D'B} = \frac{PQ}{BD} = \frac{D'Q}{D'D} = \frac{10}{26}$</p> <p>$PQ = \frac{50}{13}\text{cm}$</p>	 <p>1p</p> <p>1p</p> <p>1p</p> <p>1p</p> <p>1p</p>
	<p>$V_{AMPD'} = V_{MAPD'} = \frac{A_{APD'} \cdot d(M, ADD')}{3}$</p> <p>c) $d(M, ADD') = MN, N$ mijlocul lui $(AD') \Rightarrow MN = \frac{AB}{2} = 3\text{cm}$</p> <p>$A_{APD'} = \frac{AD \cdot PD'}{2} = 40\text{cm}^2$</p> <p>$V_{MAPD'} = 40\text{cm}^3$</p>	<p>1p</p> <p>2p</p> <p>1p</p> <p>1p</p>
2.	<p>a) $AM = MT = 4\sqrt{2}\text{m}; TN = NB = 2\sqrt{2}\text{m}$</p> <p>$L = 2(4\sqrt{2} + 2\sqrt{2}) = 12\sqrt{2}\text{m}$</p>	<p>2p</p> <p>3p</p>
	<p>b) $R' = 6\text{m}; R = 4\text{m}; r = 2\text{m}$</p>	<p>1p</p>

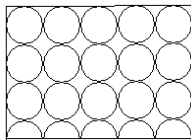
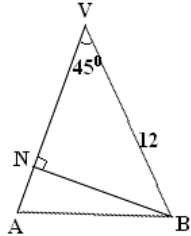
	$S_1 = \frac{\pi}{2}(R^2 + r^2 - R^2) = 12\pi m^2 \approx 37,8m^2$ $S_2 = 2TN \cdot 0,5 = 2\sqrt{2}m \approx 2,82m^2$ $S = S_1 - S_2 \approx 37,8 - 2,82 = 34,98m^2$	2p 1p 1p
	c) $L_r = 2\pi R = 12\pi m \approx 37,8m = 3780cm$ $3780:30 = 126$ (arbuști pe circumferința rondului) $L_a = \pi(R+r) = 6\pi m \approx 18,9m = 1890cm$ $1890:30 = 63$ (arbuști) Finalizare: $126 + 63 - 1 = 188$ arbuști	1p 1p 1p 1p 1p

BAREM DE EVALUARE ȘI DE NOTARE

Varianta 15

Prof. Badea Daniela

SUBIECTUL I		(30 de puncte)
1.	x	5p
2.	9	5p
3.	$\sqrt{2}$	5p
4.	$\frac{7}{8}$	5p
5.	36	5p
6.	36	5p
SUBIECTUL II		(30 de puncte)
1.	Desen Notății	4p 1p
2.	$\frac{x+y+z+t}{4} = 1904$ $x = \frac{3}{5}y; y = \frac{3}{5}z; z = \frac{3}{5}t$ $\frac{27}{125}t + \frac{9}{25}t + \frac{3}{5}t + t = 1904 \Leftrightarrow t = 875$ $x = 189; y = 315; z = 525$	1p 1p 2p 1p
3.	$a + 6b = 77 \Leftrightarrow a + 2b = 77 - 4b$ $(a + 2b):11 \Leftrightarrow (77 - 4b):11$	1p 1p

	$\left. \begin{array}{l} (77-4b):11 \\ 77:11 \end{array} \right\} \Rightarrow 4b:11$	1p
	finalizare	2p
4.	<p>a) $G_f \cap G_g = \{M\} \Rightarrow f(5) = 6 \Rightarrow g(5) = 6$</p> <p>$N(1;-2) \in G_g \Leftrightarrow g(1) = -2$</p> $\begin{cases} 5m + n = 6 \\ m + n = -2 \end{cases}$ <p>$g(x) = 2x - 4$</p>	<p>1p</p> <p>1p</p> <p>2p</p> <p>1p</p>
	<p>b) $G_f \cap Oy = \{A\} \Rightarrow f(0) = 1 \Rightarrow A(0;1)$</p> <p>$G_g \cap Oy = \{B\} \Rightarrow g(0) = -4 \Rightarrow B(0;-4)$</p> $A_{MAB} = \frac{AB \cdot h_M}{2}$ $A_{MAB} = \frac{25}{2}$	<p>1p</p> <p>1p</p> <p>2p</p> <p>1p</p>
5	$\sqrt{x^2 - 4x + 13} = \sqrt{(x-2)^2 + 9} \geq \sqrt{9} = 3, (\forall) x \in \mathbb{R}$ $\sqrt{y^2 + 6y + 34} = \sqrt{(y+3)^2 + 25} \geq \sqrt{25} = 5, (\forall) y \in \mathbb{R}$ <p>$N \geq 8, (\forall) x, y \in \mathbb{R} \Rightarrow$ valoarea minimă este 8.</p>	<p>2p</p> <p>2p</p> <p>1p</p>
SUBIECTUL III		(30 de puncte)
1.	<p>a) cercurile au diametrul de 24 cm</p> <p>$120:24=5$</p> <p>$85=243+13=243+12+1$</p> <p>Total 35 coșulețe (semidiscuri)</p>	 <p>1p</p> <p>1p</p> <p>1p</p> <p>2p</p>
	<p>b) ΔVAB isoscel cu $m(\angle AVB) = 45^\circ$</p> <p>ΔVNB dr.isoscel $\Rightarrow VN=NB=6\sqrt{2}$</p> <p>$\Delta ANB$ dr. $\Rightarrow AB = l = 12\sqrt{2-\sqrt{2}}$ cm</p> <p>$1,41 < \sqrt{2} < 1,42 \Rightarrow 0,58 < 2 - \sqrt{2} < 0,59$</p> <p>$\Rightarrow 83,52 < l^2 < 84,96 \Rightarrow 9^2 < l^2 < 10^2 \Leftrightarrow 9 < l < 10$</p>	 <p>1p</p> <p>1p</p> <p>1p</p> <p>1p</p> <p>1p</p>
	<p>c) ΔMAB echilateral</p> <p>$p = 4MB = 4l \xrightarrow{\text{din b)}} 36\text{cm} < p < 40\text{cm}$</p> <p>$1260\text{cm} < 35p < 1400\text{cm}$</p> <p>$1260\text{cm} = 12,6\text{m} > 12\text{m}$</p> <p>Nu sunt suficienți 12m de pamblică</p>	<p>1p</p> <p>1p</p> <p>1p</p> <p>1p</p> <p>1p</p>

2.	a) $DB = l\sqrt{2} = 24\sqrt{2}\text{cm}$ $\triangle ABCD$ echilateral $\Rightarrow BC = 24\sqrt{2}\text{cm}$ $P_{ABCD} = 2(AB+BC) = 2(24 + 24\sqrt{2}) = 48(1+\sqrt{2})\text{cm}$ $AC = AO+OC = 12\sqrt{2} + 12\sqrt{6}\text{cm}$ $L = P_{ABCD} + BD + AC = 12(4 + 7\sqrt{2} + \sqrt{6})\text{cm}$	1p 1p 1p 1p 1p
	b) $S_{ABCD} = S_{ABD} + S_{BCD}$ $S_{ABD} = \frac{l^2}{2} = 288\text{cm}^2$ $S_{BCD} = 288\sqrt{3}\text{cm}^2$ $S_{ABCD} = 288(1 + \sqrt{3})\text{cm}^2$	1p 1p 1p 2p
	c) $S_{MNPQ} = AC \cdot BD$ $ABCD$ ortodiagonal $\Rightarrow S_{ABCD} = \frac{AC \cdot BD}{2}$ $\frac{S_{ABCD}}{S_{MNPQ}} = \frac{1}{2}$	2p 1p 2p

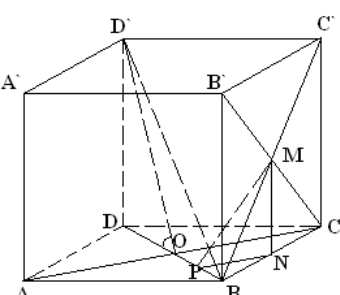
BAREM DE EVALUARE ȘI DE NOTARE

Varianta 16

Prof. Badea Daniela

SUBIECTUL I		(30 de puncte)
1.	$\frac{1}{2}$	5p
2.	6	5p
3.	20	5p
4.	7	5p
5.	$12\sqrt{2}$	5p
6.	2200	5p
SUBIECTUL II		(30 de puncte)
1.	Desen Notații	4p 1p

2.	$(\sqrt{7} - \sqrt{3})^2 - 7 + 2\sqrt{21}$ $10 - 2\sqrt{21} - 7 + 2\sqrt{21} = 3$	3p 2p
3.	$E(x) = -8x + 16$ $E(x) = 0 \Leftrightarrow -8x + 16 = 0$ $x = 2$	3p 1p 1p
4.	a) $x = \text{nr. vase cu câte 3 fire}; y = \text{nr. vase cu câte 5 fire}$ $\begin{cases} x + y = 40 \\ 3x + 5y = 154 \end{cases}$ $\begin{cases} x = 23 \\ y = 17 \end{cases}$	1p 2p 2p
	b) $154 = 2 \cdot 7 \cdot 11$ mulțimea divizorilor lui 154 mai mici ca 17 este $\{1, 2, 7, 11, 14\}$ nr. minim de vase : $154:14=11$	1p 2p 2p
5	$f(-2) = 5 \Rightarrow A(-2; 5) \in G_f$, Reprezentarea punctului A $f(3) = -5 \Rightarrow B(3; -5) \in G_f$ Reprezentarea punctului A Trasarea graficului	1p 1p 1p 1p 1p
SUBIECTUL III		(30 de puncte)
1.	a) $2x = a\sqrt{2} \Leftrightarrow a = x\sqrt{2}$ $l = 2(x + a) = 2x(1 + \sqrt{2})$	3p 2p
	b) $P = 8 \cdot 2(x + a) = 16x(1 + \sqrt{2})$ $P = 16 \cdot 10(\sqrt{2} - 1)(1 + \sqrt{2})$ $P = 160\text{cm}$	2p 1p 1p
	c) $S_{\text{ABCEFGH}} = l^2 - 4 \cdot \frac{a^2}{2} = 8x^2(1 + \sqrt{2})$ $S_{\text{paralelogram}} = (2x + a) \cdot a \cdot \sin 45^\circ = x^2(2 + \sqrt{2})$ $S_t = 8x^2(1 + \sqrt{2}) + 8x^2(2 + \sqrt{2}) = 8x^2(3 + 2\sqrt{2})$ $S_t = 8 \cdot 100(\sqrt{2} - 1)^2(3 + 2\sqrt{2}) = 800\text{cm}^2$	1p 1p 1p 2p

2.	<p>a)</p> $\left. \begin{array}{l} MN \perp (ABC) \\ PN \perp BD \\ PN, BD \perp (ABC) \end{array} \right\} \begin{array}{l} T_{3\perp} \\ \Rightarrow MP \perp BD \Rightarrow d(M, BD) = MP \end{array}$ $\left. \begin{array}{l} \Delta MNP, \angle N = 1dr \\ MN = 6 \\ NP = \frac{AC}{4} = 3\sqrt{2} \end{array} \right\} \begin{array}{l} T.P. \\ \Rightarrow MP = 3\sqrt{6}cm \end{array}$		<p>2p</p> <p>3p</p>
	<p>b)</p> $\left. \begin{array}{l} (D'AC) \cap (ABC) = AC \\ D'O \perp AC, D'O \subset (D'AC) \\ DO \perp AC, D'O \subset (ABC) \end{array} \right\} \Rightarrow m(\angle(D'AC), (ABC)) = m(\angle D'OD)$ $\Delta D'OD, \angle D = 1dr \xrightarrow{T.P.} D'O = 6\sqrt{6}$ $\sin O = \frac{DD'}{D'O} = \frac{12}{6\sqrt{6}} = \frac{\sqrt{6}}{3}$		<p>2p</p> <p>1p</p> <p>2p</p>
	<p>c)</p> $\left. \begin{array}{l} DE \perp D'O \\ AC \perp (D'OD) \\ DE \subset (D'OD) \end{array} \right\} \Rightarrow AC \perp DE \Rightarrow DE \perp (D'AC) \Rightarrow d(D, (D'AC)) = DE$ $DE = \frac{DO \cdot DD'}{D'O} = 4\sqrt{3}cm$		<p>3p</p> <p>2p</p>