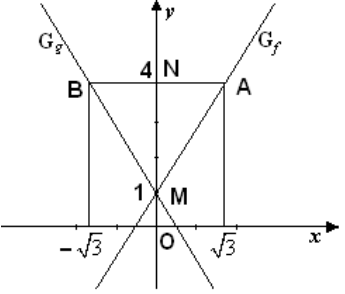
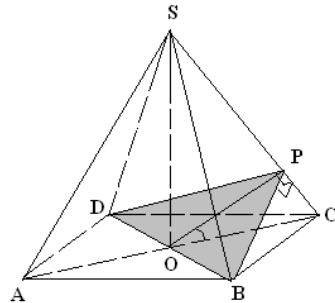


BAREM DE EVALUARE ȘI DE NOTARE

Varianta 17

Prof. Badea Ion

SUBIECTUL I		(30 de puncte)
1.	$2\sqrt{5}$	5p
2.	75	5p
3.	1	5p
4.	8	5p
5.	$18\sqrt{2}$	5p
6.	893	5p
SUBIECTUL II		(30 de puncte)
1.	Desen cercuri tangente exterioare Desen tangentă comună	3p 2p
2.	$\left. \begin{array}{l} 10 \text{ muncitori} \dots\dots\dots 7 \text{ zile} \\ 14 \text{ muncitori} \dots\dots\dots x \text{ zile} \end{array} \right\} \begin{array}{l} i.p. \\ \Rightarrow \end{array}$ $x = \frac{10 \cdot 7}{14} = 5$ $3 + 5 = 8 \text{ zile}$	2p 2p 1p
3.	$13 \mid \overline{abc} \Leftrightarrow 13 \mid 100a + 10b + c$ $\Leftrightarrow 13 \mid 91a + 13b + (9a - 3b + c)$ $\Leftrightarrow 13 \mid 13(7a + b) + (9a - 3b + c)$ $\Leftrightarrow 13 \mid 3a - 3b + c$	1p 2p 1p 1p
4.	a) $G_f \cap G_g = \{M\} \Leftrightarrow f(x) = g(x)$ $\Leftrightarrow \sqrt{3}x + 1 = 1 - \sqrt{3}x$ $\Leftrightarrow 2\sqrt{3}x = 0 \Leftrightarrow x = 0$ $\Rightarrow M(0,1)$	1p 1p 2p 1p

	<p>b) $A(\sqrt{3}, 4) \in G_f$ $B(-\sqrt{3}, 4) \in G_g$ ΔMAB isoscel (MN înălțime și mediană) ΔMAN dr. $\angle N = 1 \text{ dr}$ $MN=3, AN=\sqrt{3}$</p> $\Rightarrow \operatorname{tg} A = \frac{MN}{AN} = \frac{3}{\sqrt{3}} = \sqrt{3}$ <p>$\Rightarrow m(\angle A) = 60^\circ \Rightarrow m(\angle AMB) = 60^\circ$</p>		<p>1p 1p 1p 1p 1p</p>
5	$A = \frac{(1 + \sqrt{2} - \sqrt{3} + \sqrt{11}) + \sqrt{7}(1 + \sqrt{2} - \sqrt{3} + \sqrt{11})}{1 + \sqrt{2} - \sqrt{3} + \sqrt{11}}$ <p>$\Leftrightarrow A = 1 + \sqrt{7}$ $2^2 < 7 < 3^2 \Leftrightarrow 2 < \sqrt{7} < 3/ + 1$ $\Leftrightarrow 3 < 1 + \sqrt{7} < 4$ $\Leftrightarrow A \in (3; 4)$</p>		<p>1p 1p 1p 1p 1p</p>
SUBIECTUL III			(30 de puncte)
1.	<p>a) fie $SO \perp (ABD)$ $\Rightarrow \Delta SOA \equiv \Delta SOB \equiv \Delta SOC \equiv \Delta SOD$ (I.C.) $\Rightarrow OA = OB = OC = OD \Leftrightarrow O$ centrul bazei (pătrat) $\Rightarrow SABCD$ regulată ΔSBD dr.is $\Rightarrow SO = 5\sqrt{2}$ $V = \frac{A_b \cdot h}{3} = \frac{10^2 \cdot 5\sqrt{2}}{3} = \frac{500\sqrt{2}}{3} \text{ cm}^3$</p>		<p>2p 1p 2p</p>
	<p>b) P_{PBD} minim $\Leftrightarrow PB$ și PC au lungime minimă $\Leftrightarrow PB \perp SC$ și $PD \perp SC$ ΔSBC echilateral $\Rightarrow BP$ mediană $\Rightarrow P$ mijlocul lui (SC) $\Leftrightarrow SP = 5 \text{ cm}$</p>		<p>1p 1p 1p 1p 1p</p>
	<p>c) ΔPBD isoscel $\Rightarrow PO \perp BD$ $(PBD) \cap (ACD) = BD$ $PO \perp BD, PO \subset (PBD)$ $CO \perp BD, CO \subset (ACD)$</p> $\Rightarrow m(\angle(PBD), (ACD)) = m(\angle POC)$		<p>1p 2p</p>

	$\Delta SOC \text{ dr.is.} \Rightarrow m(\sphericalangle POC) = 45^\circ$	2p
2.	<p>a) $EG = l\sqrt{3} \cong 20,76\text{cm}$; $103800:20,76=50$ plăci încap pe lungime $600=36\cdot 16+24 \Rightarrow 16\cdot 2+1=33$ rânduri de plăci încap pe lățime $33\cdot 50 = 1650$ plăci (din care 16 sunt tăiate pe jumătate) $\Rightarrow 1636$ plăci întregi $1650 + \frac{100}{6} = 1666 + \frac{4}{6}$ $\Rightarrow 1667$ nr. total de plăci</p>	1p 1p 1p 1p 1p
	<p>b) plăcile închise la culoare se află: la fiecare rând cu număr impar din cele 33 rânduri $\Rightarrow 17$ rânduri pe rândurile menționate plăcile cu număr impar $\Rightarrow 25$ plăci $17\cdot 25 = 425$ plăci închise la culoare</p>	2p 2p 1p
	<p>c) $A=62,28\text{m}^2$ $62,28\cdot 1,2=74,736 \Rightarrow 75$ saci $\Rightarrow 75\cdot 14=1050$ lei $63\cdot 30=1890$ lei costă gresia $\frac{65}{100}\cdot (1050+1890) = 1911$ lei costă manopera $S_7=4851$ lei</p>	1p 1p 1p 1p 1p

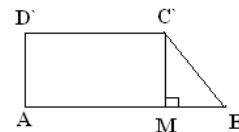
BAREM DE EVALUARE ȘI DE NOTARE

Varianta 18

Prof. Badea Ion

SUBIECTUL I		(30 de puncte)
1.	5	5p
2.	0	5p
3.	A	5p
4.	38	5p
5.	$12\pi - 9\sqrt{3}$	5p
6.	35	5p
SUBIECTUL II		(30 de puncte)

1.	Desen notații	4p 1p
2.	$x = \text{nr. kg fursecuri de } 18 \text{ lei/kg}$ $18x + 250 = (x + 10) \cdot 20$ $\Leftrightarrow x = 25$	1p 2p 2p
3.	$N = 8 - 2\sqrt{15} + 8 + 2\sqrt{15} - \sqrt{15} + 3 + 5 + \sqrt{15}$ $N = 24 \in \mathbb{N}$	3p 2p
4.	a) $A(0; 2) \in G_f \Leftrightarrow f(0) = 2 \Leftrightarrow a = 2$ $f(-2) = 6, f(1) = 0, f(4) = 3$ Trasarea graficului	1p 1p 3p
	b) $x \in [-2; 1]$ avem $f(x) = 2 \Leftrightarrow -2x + 2 = 2$ $\Leftrightarrow x = 0 \in [-2; 1] \Rightarrow S_1 = \{0\}$ $x \in (1; 4]$ avem $f(x) = 2 \Leftrightarrow x - 1 = 2$ $\Leftrightarrow x = 3 \in (1; 4] \Rightarrow S_2 = \{3\}$ $\Rightarrow S_3 = S_1 \cup S_2 = \{0; 3\}$	1p 1p 1p 1p 1p
5	$E(x) = (x^4 + 2x^3 + x^2) + (4x^2 - 4x + 1) + (m - 5)x^2$ $m \geq 5 \Leftrightarrow m - 5 \geq 0 \Rightarrow E(x) = \underbrace{x^2}_{\geq 0} \underbrace{(x+1)^2}_{\geq 0} + \underbrace{(2x-1)^2}_{\geq 0} + \underbrace{(m-5)x^2}_{\geq 0}$ $\Rightarrow E(x) \geq 0, (\forall)x \in \mathbb{R} \text{ și } (\forall)m \geq 5$	2p 2p 1p
SUBIECTUL III		(30 de puncte)
1.	a) $CD \parallel AB, AB \subset \alpha \Rightarrow CD \parallel \alpha$ $CD \parallel \alpha, (CDD') \cap \alpha = C'D' \Rightarrow CD \parallel C'D' \Rightarrow ABC'D'$ trapez $\left. \begin{array}{l} DD' \perp \alpha \\ DA \perp AB \\ AB, D'A \subset \alpha \end{array} \right\} \begin{array}{l} R_1 T_3 L \\ \Rightarrow D'A \perp AB \end{array}$ $\Rightarrow ABC'D'$ trapez dreptunghic	1p 1p 2p 1p
	b) $m(\sphericalangle(ABC), \alpha) = 30^\circ = m(\sphericalangle DAD')$ $\Delta DAD'$ dr., $DD' = CC' \Rightarrow AD = 8\text{cm}, AD' = 4\sqrt{3}$ $\Delta C'MB$ dr. $\xrightarrow{T.P.} \Rightarrow BC' = 8\text{cm}$ $P_{ABC'D'} = AB + BC' + C'D' + AD' = 4(7 + \sqrt{3})\text{cm}$	1p 1p 1p 2p



	<p>c) $S_t = S_{ABCD} + S_{ABC'D'} + S_{DCC'D'} + S_{ADD'} + S_{BCC'}$</p> $S_{ABCD} = \frac{(AB+CD) \cdot AD}{2} = 80\text{cm}^2; S_{ABC'D'} = \frac{(AB+C'D') \cdot AD'}{2} = 40\sqrt{3}\text{cm}^2$ $S_{DCC'D'} = 32\text{cm}^2; S_{ADD'} = \frac{DD' \cdot AD'}{2} = 8\sqrt{3}\text{cm}^2; S_{BCC'} = \frac{CC' \cdot BC'}{2} = 16\text{cm}^2$ $S_t = 16(8 + 3\sqrt{3})\text{cm}^2$	<p>1p</p> <p>3p</p> <p>1p</p>
2.	<p>a) $l = \sqrt{484} = 22 \Rightarrow 4l = 2(2x+8) = 88 \Leftrightarrow x = 18, x+8 = 26$</p> <p>$S = A_1 + A_2 + A_3 = 468\text{ha}$</p> $\frac{A_1}{A_2} = \frac{3}{4}, \frac{A_2}{A_3} = \frac{4}{5} \Leftrightarrow \frac{A_1}{3} = \frac{A_2}{4} = \frac{A_3}{5} = \frac{S}{12} = 39$ <p>$A_1 = \frac{S}{4} = 117\text{ha}, A_2 = \frac{S}{3} = 156\text{ha}, A_3 = \frac{5S}{12} = 195\text{ha}$</p>	<p>1p</p> <p>1p</p> <p>1p</p> <p>2p</p>
	<p>b)</p> $\frac{v}{4} = \frac{r}{1} = \frac{c}{6} \Leftrightarrow \frac{v}{4} = \frac{r}{3} = \frac{c}{6} = \frac{v+r+c}{13} = \frac{A_1}{13} = 9$ $\frac{v}{9} = \frac{r}{3} = \frac{c}{9}$ <p>$v=36\text{ha}, r=27\text{ha}, c=54\text{ha}.$</p>	<p>3p</p> <p>2p</p>
	<p>c) $195 \cdot 5 = 975\text{t} = 975000\text{kg}, 975000 \cdot 1,5 = 1462500\text{lei}$ (costă grâul)</p> <p>$156 \cdot 40 = 6240\text{t} = 6240000\text{kg}, 6240000 \cdot 2 = 12480000\text{lei}$ (costă fructele)</p> <p>$12480000 \cdot \frac{1}{8} = 1560000\text{lei}$ (costă legumele)</p> <p>$S_{\text{totală}} = 15502500\text{lei}.$</p>	<p>1p</p> <p>1p</p> <p>1p</p> <p>2p</p>

BAREM DE EVALUARE ȘI DE NOTARE

Varianta 19

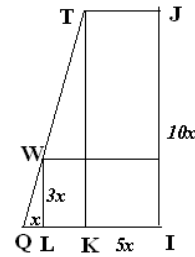
Prof. Badea Ion

SUBIECTUL I		(30 de puncte)
1.	3	5p
2.	200	5p
3.	$S = \{-2; 8\}$	5p
4.	14	5p
5.	0,3	5p

6.	60	5p
SUBIECTUL II		(30 de puncte)
1.	Desen Notății denumire	3p 1p 1p
2.	$a = 2\sqrt{15} + 8 = 2\sqrt{15} + 8$ $b = 2\sqrt{15} - 8 = 8 - 2\sqrt{15}$ $m_g = \sqrt{a \cdot b} = \sqrt{(8 + 2\sqrt{15})(8 - 2\sqrt{15})}$ $m_g = 2$	1p 1p 2p 1p
3.	$\frac{92}{100} \cdot 150t$ rămân după spălare $\frac{95}{100} \cdot \left(\frac{92}{100} \cdot 150 \right) t$ rămân după strivire $\frac{12}{100} \cdot \left(\frac{95}{100} \cdot \left(\frac{92}{100} \cdot 150 \right) \right) t$ zahăr= $\frac{12}{100} \cdot \frac{95}{100} \cdot \frac{92}{100} \cdot 150000 = 15732 \text{kg/zi}$ $15732 \cdot 5 = 78660 \text{kg} = 78,66t$	1p 1p 1p 1p 1p
4.	<p>a) $E(x) = \frac{3x^2 + 5x}{(1-3x)(1+3x)} \cdot \frac{(1-3x)^2}{2x(3x+5)}$</p> $E(x) = \frac{x(3x+5)}{(1+3x)} \cdot \frac{(1-3x)}{2x(3x+5)}$ <p>finalizare</p>	3p 1p 1p
	<p>b) $\frac{1-3x}{2(1+3x)} \leq -\frac{1}{2} \Leftrightarrow \frac{1-3x}{2(1+3x)} + \frac{1}{2} \leq 0$</p> $\Leftrightarrow \frac{1-3x+1+3x}{2(1+3x)} \leq 0 \Leftrightarrow \frac{1}{1+3x} \leq 0$ $1+3x < 0 \Leftrightarrow x < -\frac{1}{3}$ $\Rightarrow x \in \left(-\infty, -\frac{1}{3} \right) \setminus \left\{ -\frac{5}{3} \right\}$	1p 1p 1p 2p

5	$f(a-1) = (\sqrt{3}-1)(a-1) - 2\sqrt{3}$ $= (1-a) + \sqrt{3}(a-3)$ $f(a-1) = 2b\sqrt{3} \Leftrightarrow (1-a) + \sqrt{3}(a-3) = 2b\sqrt{3}, a \text{ și } b \in \mathbb{Q}$ $\Leftrightarrow \begin{cases} 1-a=0 \\ a-3=2b \end{cases}$ $\Leftrightarrow \begin{cases} a=1 \\ b=-1 \end{cases}$	<p>1p</p> <p>1p</p> <p>1p</p> <p>1p</p>
<p>SUBIECTUL III</p>		<p>(30 de puncte)</p>
1.	<p>a) $A_1 = 2A_b \Leftrightarrow \frac{3l \cdot a_p}{2} = \frac{l^2 \sqrt{3}}{2} \Leftrightarrow a_p = \frac{l\sqrt{3}}{3}$</p> $x^2 = a_p^2 - a_b^2 \Leftrightarrow x^2 = \frac{9l^2}{36} = \frac{l^2}{4}$ $\Leftrightarrow l = 2x$	<p>2p</p> <p>2p</p> <p>1p</p>
	<p>b) $A_b = \frac{l^2 \sqrt{3}}{4} = 324\sqrt{3} \text{ cm}^2$</p> $A_1 = 2A_b = 628\sqrt{3} \text{ cm}^2$ $V = \frac{324\sqrt{3} \cdot 18}{3} = 1944\sqrt{3} \text{ cm}^3$	<p>1p</p> <p>2p</p> <p>2p</p>
	<p>c) $OT \perp VM$ $BC \perp VM$ $BC \perp OM$ } $\Rightarrow BC \perp (VOM), OT \subset (VOM) \Rightarrow$ $\Rightarrow BC \perp OT$ $\Rightarrow OT \perp (VBC) \Leftrightarrow pr_{(VBC)} VO = VT$ $\Rightarrow m(\sphericalangle VO, (VBC)) = m(\sphericalangle OVT)$</p> $\Delta VOM \text{ dr.} \Rightarrow \cos V = \frac{VO}{VM} = \frac{x}{\frac{2x\sqrt{3}}{3}} = \frac{\sqrt{3}}{2}$ $m(\sphericalangle OVT) = 30^\circ$	<p>1p</p> <p>2p</p> <p>1p</p> <p>1p</p>
2.	<p>a) $P_b = 2(2x\sqrt{2} + x + 2x\sqrt{2} + 2x + 3x\sqrt{2} + 2x + 3x\sqrt{2} + 5x + 2x)$</p> $P_b = 2(10x\sqrt{2} + 12x)$ $P_b = 4x(5\sqrt{2} + 6)$	<p>3p</p> <p>1p</p> <p>1p</p>

	<p>b) $S_1 = 4x^2 + 9x^2 + 16x^2 + 25x^2 - (2x^2 + 4x^2) = 48x^2$ $S_2 = 4x^2$ $S_b = 52x^2 = 52cm^2$</p>	<p>3p 1p 1p</p>
	<p>c) $\Delta QLW \sim \Delta QIT \Rightarrow \frac{QL}{QK} = \frac{WL}{IT} \Leftrightarrow QK = \frac{10x}{3} \Rightarrow TJ = \frac{5x}{3}$ $\Delta QLW \sim \Delta QIT \Rightarrow \frac{QL}{QK} = \frac{WL}{IT} \Leftrightarrow QK = \frac{10x}{3} \Rightarrow TJ = \frac{5x}{3}$ $TS = \frac{5x}{3} + 3 \cdot 6x + 5x = \frac{74x}{3}$ $A = \frac{740x^2}{3}; A_b = 48x^2 \cdot 4 = 192x^2 \Rightarrow$ $\frac{A_b}{A} = \frac{144}{185} = 77, (837)\% \cong 78\%$ $\Rightarrow p = 22\%$</p>	<p>1p 1p 1p 1p</p>



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