

BAREM DE EVALUARE ȘI DE NOTARE

Varianta 149

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SUBIECTUL I		(30 de puncte)
1.	$A \cap (\mathbb{R} \setminus \mathbb{Q}) = \{-3\sqrt{2}; \pi\}$	5p
2.	$S = \{-3; 5\}$	5p
3.	$d = 13\text{cm}$	5p
4.	60°	5p
5.	$p = \frac{19}{900} = 0,021$	5p
6.	44 miliarde	5p
SUBIECTUL II		(30 de puncte)
1.	$\begin{cases} a + 8 = b \\ \frac{a + 5}{b - 1} = \frac{8}{9} \end{cases}$; rezolvând sistemul obținem $a = 11; b = 19$	5p
2.	$L = 800$; aria devine: $A = (l + 25\% \cdot l)(L + 25\% \cdot L) = lL + \frac{1}{4}lL + \frac{1}{4}lL + \frac{1}{16}lL = \frac{25}{16}lL = 1250\text{cm}^2$	5p
3.	$A_{\text{pistei}} = \frac{A_{\text{lat.cilindru}}}{2} = \frac{2\pi r g}{2} = \pi \cdot 4 \cdot 5 = 20\pi \text{ m}^2$	5p
4.	$E(x) = \frac{1}{\sqrt{x} - \sqrt{1-x}} - \frac{1}{\sqrt{x} + \sqrt{1-x}} =$ $\text{a) } = \frac{\sqrt{x} + \sqrt{1-x} - \sqrt{x} + \sqrt{1-x}}{x - (1-x)} = \frac{2\sqrt{1-x}}{2x-1}$ $\Rightarrow E(2\sqrt{3}-3) = \frac{2\sqrt{1-2\sqrt{3}+3}}{2(2\sqrt{3}-3)-1} = \frac{2\sqrt{(1-\sqrt{3})^2}}{4\sqrt{3}-7} = \frac{2 1-\sqrt{3} }{4\sqrt{3}-7} = \frac{2(\sqrt{3}-1)}{4\sqrt{3}-7} =$ $= (\text{rationalizare}) = -2(3\sqrt{3}+5)$	5p

	$\Leftrightarrow \sqrt{1-x} = 2x-1; \text{cond} : \begin{cases} 1-x \geq 0 \\ 2x-1 > 0 \end{cases} \Leftrightarrow x \in \left(\frac{1}{2}; 1\right]$ <p>b) $E(x)=2$ Avem: $1-x = 4x^2 - 4x + 1 \Leftrightarrow 4x^2 - 3x = 0 \Leftrightarrow x_1 = 0 \notin \left(\frac{1}{2}; 1\right]$ si</p> $x_2 = \frac{3}{4} \in \left(\frac{1}{2}; 1\right]$	5p
5	<p>Not. $AD=a$ cm $\Rightarrow AB=2a$; $P_{ABCD}=30 \Rightarrow 4a+2a=30 \Rightarrow a=5$cm Cateta opusa unghiului de 30° este $\frac{1}{2}$ din ipotenuza. $\Rightarrow h=2,5$cm. $\Rightarrow A_{ABCD}=b \cdot h=10 \cdot 2,5=25\text{cm}^2$</p>	5p
SUBIECTUL III		(30 de puncte)
1.	$\left. \begin{array}{l} MA \perp (ABCD) \\ \text{a) } DC \subset (ABCD) \\ AD \perp DC (m(\angle ADC) = 90^\circ) \end{array} \right\} \begin{array}{l} \text{Teor. 3 perp.} \\ \Rightarrow MD \perp DC \end{array}$ <p>Ducem $OE \perp DC \Rightarrow OE \parallel AD$, dar $O = \text{mijl. segm. } [MC] \Rightarrow OE = \text{linie mijl. a}$ $\triangle MDC \Rightarrow OE = \frac{MD}{2}$; in $\triangle MDC$ calc. $MD=60\text{cm} \Rightarrow OE=30\text{cm}$</p>	5p
	<p>b) In $\triangle ADM (m(\angle A) = 90^\circ)$ avem: $\sin(\angle ADM) = \frac{MA}{MD} = \frac{36}{60} = \frac{3}{5}$ In $\triangle ABM (m(\angle A) = 90^\circ)$ avem: $\cos(\angle ABM) = \frac{AB}{MB} = \frac{27}{45} = \frac{3}{5}$ unde BM s-a calc. in $\triangle MAB (m(\angle A) = 90^\circ)$ cu teor. Pitagora In $\triangle ADB (m(\angle A) = 90^\circ)$ avem: $tg(\angle ADB) = \frac{AD}{AB} = \frac{48}{27} = \frac{16}{9}$ $\Rightarrow \sin(\angle ADM) + 3\cos(\angle ABM) + 4tg(\angle ADB) = \frac{428}{45}$</p>	5p
	<p>c) Avem $\left. \begin{array}{l} CD \perp MD (cf. pct. a)) \\ CD \perp AD (lat. dreptunghi) \end{array} \right\} \Rightarrow CD \perp (MD; AD) \Rightarrow CD \perp (MAD)$ $\Rightarrow pr_{(MAD)} CM = MD = 60\text{cm}$ (s-a calc. la pct. a))</p>	5p
2.	<p>a) $V_{\text{cub}} = 3,375\text{m}^3$ $V_{\text{piramida}} = 1,125\text{m}^3$ $\Rightarrow V_{\text{corp}} = 4,5\text{m}^3$</p>	5p
	<p>b) $S_{\text{lat. piram.}} = \frac{p \cdot ap}{2}$; $ap = \frac{1,5}{2} \Rightarrow S_{\text{lat. piram.}} = \frac{4,5}{2}\text{m}^2$ $S_{\text{lat. cub}} = p \cdot h = 6 \cdot 1,5 = 9\text{m}^2$</p>	5p

	c) $\rho = \frac{m}{V} \Rightarrow m = V \rho = 4500 \text{ dm}^3 \cdot 1,5 = 6750 \text{ kg}$	5p
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