

Mate 2000 Consolidare
Clasa a VIII-a, semestrul al II-lea
TESTE DE AUTOEVALUARE

– SOLUȚII –

Test de autoevaluare – p. 23

- I.** 1. 4.
2. -1.
3. 2.
4. 3.
5. $\sqrt{3}$.
6. $\{0, 1, 4, 9\}$.

- II.** 1. C. 2. D. 3. B. 4. C.

- III.** 1. $x = 2$.
2. $m = 2$.
3. $f(x) = 3x - 5$.
4. $S = 2013 \cdot 1004$; $3 \mid 2013$ și $4 \mid 1004 \Rightarrow 12 \mid S$.

Test de autoevaluare – p. 33

- I.** 1. -1.
2. 3.
3. $S = \{-3; 3\}$.
4. 1.
5. 3.
6. -1.

- II.** 1. C. 2. D. 3. B. 4. D.

- III.** 1. $S = \{4\}$.
2. $S = \{2\}$.
3. $S = \{5\}$.
4. $S = \{2\sqrt{6}\}$.

Test de autoevaluare – p. 49

- I.**
1. (2; -2).
 2. $a = 4; b = 3$.
 3. 10.
 4. 5.
 5. 8 fete.
 6. (-3; 1).
- II.** 1. D. 2. C. 3. B. 4. C.
- III.**
1. $S = \{(5; -3)\}$.
 2. 80 fete; 28 băieți.
 3. 3600 lei.
 4. $x + 1 = 30k, k \in \mathbb{N}^*$; a) Pentru $k = 4, x = 120 - 1 = 119$ (elevi);
b) Numărul maxim este 179.

Test de autoevaluare – p. 57

- I.**
1. $S \in \{-7, 3\}$.
 2. 4.
 3. $S = \left\{-1; \frac{5}{4}\right\}$.
 4. -2.
 5. $S = \left\{-\frac{5}{4}; \frac{3}{2}\right\}$.
 6. $m = 4; n = 3$.
- II.** 1. B. 2. C. 3. D. 4. A.
- III.**
1. $\Delta = (a^2 + 6a + 12)^2 - 4(a^2 + 6a + 9)$. Se notează $a^2 + 6a + 9 = t \Rightarrow \Delta = (t + 1)^2 + 8 > 0, \forall a \in \mathbb{R}$.
 2. $S = \{-13; 1\}$ pentru oricare $x \in \mathbb{R} \setminus \left\{-\frac{1}{2}; 2\right\}$.
 3. Ecuația $2x^2 + 7x + 3 = 0$ are $S = \left\{-3; -\frac{1}{2}\right\}$, de unde $m = -8$ și $n = -4$.
 4. $\Delta = (m - n + 1)^2 + 4(m - n + 2)$. Se notează $m - n + 1 = t$ și atunci $\Delta = (t + 1)^2 + 4 > 0$ pentru oricare m și n numere reale.

Test de autoevaluare – p. 65

- I.**
- $\{1, 2, 3, 4, 5\}$.
 - $\{-2, -1, 0, 1, 2\}$.
 - $[-3; 3]$.
 - $S = (-2\sqrt{3} - 1; 1)$.
 - $S = (-\infty; -7) \setminus \{-5\}$.
 - $S = [-2; +\infty)$.
- II.** 1. C. 2. B. 3. B. 4. C.
- III.**
- $S = [-5; 1]$.
 - $S = (-2; 1) \setminus \{-1\}$.
 - $x \in [-3; 3]$.
 - $S = [-2; +\infty)$.

Test de autoevaluare 1 – p. 81

- I.**
- 25.
 - 24.
 - $\{-3, -2, -1, 0, 1\}$.
 - 63.
 - $x = 1$.
 - $y = -1$.
- II.** 1. D. 2. B. 3. D. 4. D.
- III.**
- a) $a = 2; b = 6; f(x) = 2x + 6$; b) Se calculează aria $\triangle ABM$ în două moduri, de unde distanța este $2\sqrt{5}$.
 - a) $E(x) = \frac{x+3}{2(x-1)}$; b) $n \in \{-3, 0, 2, 3, 5\}$.
 - 2400 lei.
 - $x \in (-1; 7)$.

Test de autoevaluare 2 – p. 83

- I.**
- 120.
 - 12.
 - 0.
 - $S = \{-4; 2\}$.
 - $M(2; 2)$.
 - $x = 4$

II. 1. B. 2. D. 3. D. 4. C.

III. 1. $a = 2\sqrt{5}$; $b = \frac{2\sqrt{5}}{5}$; $m_a = \frac{6\sqrt{5}}{5}$; $m_g = 2$.

2. a) $a = -2$; $b = -1$; $f(x) = -2x + 5$; $g(x) = x - 1$; b) $S = -1590$.

3. 920 și 360.

4. a) $F(x) = \frac{x-2}{x-5}$; b) $x \in \{4, 6, 12\}$.

Test de autoevaluare – p. 99

I. 1. 512 cm^3 .
2. 15 cm.
3. $200\sqrt{3} \text{ cm}^3$.
4. 20 cm.
5. 8 cm.
6. $6\sqrt{6} \text{ cm}$.

II. 1. C. 2. B. 3. D. 4. B.

III. 1. a) $EC = 2\sqrt{13} \text{ cm}$; $BC = 6 \text{ cm}$; $\mathcal{A}_t = 180 \text{ cm}^2$; $\mathcal{V} = 288 \text{ cm}^3$;
b) $BC' = 6\sqrt{2}$; $d(A', BC') = A'O$, unde $BC' \cap B'C = \{O\}$; $d(A', BC') = \sqrt{82} \text{ cm}$.
2. a) $d(B', AC) = 12 \text{ cm}$;
b) $d(C', AD) = C'D$; $C'D = 6\sqrt{2} \text{ cm}$;
c) $d(C, (CAD)) = CQ$, unde $CQ \perp C'D$; $CQ = 3\sqrt{2} \text{ cm}$.
3. a) $d(A, BD') = 6\sqrt{6} \text{ cm}$;
b) $d(A, CD') = 9\sqrt{6} \text{ cm}$;
c) Dacă $AC \cap BD = \{O\}$, $\text{pr}_{(BDD')} AD' = D'O \Rightarrow \sphericalangle(AD', (BDD')) = \sphericalangle AD'O$;
 $m(\sphericalangle AD'O) = 30^\circ$.

Test de autoevaluare – p. 111

I. 1. $75\sqrt{3} \text{ cm}^3$.
2. 10 cm.
3. 24 cm.
4. $8\sqrt{2} \text{ cm}$.
5. 6912 cm^3 .
6. $486\sqrt{3} \text{ cm}^3$.

II. 1. B. 2. A. 3. B. 4. C.

- III. 1.** a) $\mathcal{A}_t = 36(\sqrt{34} + \sqrt{3}) \text{ cm}^2$; $\mathcal{V} = 144\sqrt{3} \text{ cm}^3$; $d(A, (VBC)) = \frac{18\sqrt{102}}{17} \text{ cm}$;
- c) Dacă $MD \perp VA$, $M \in (VA)$, $MD = 9 \text{ cm}$; $BM = 3\sqrt{13} \text{ cm}$; $\sphericalangle((VAB), (VAD)) = \sphericalangle BMD$; $\sin(\sphericalangle BMD) = \frac{2\sqrt{13}}{13}$;
- d) $\mathcal{A}_{\Delta BEC} = \frac{BC \cdot ED}{2}$; $\mathcal{A}_{\Delta BEC}$ minimă $\Rightarrow ED$ minim $\Rightarrow ED \perp VA$ și cum $DM \perp VA \Rightarrow E = M \Rightarrow AE = 5\sqrt{3} \text{ cm}$.
- 2.** a) $\mathcal{A}_{ABCD} = \mathcal{A}_{\Delta VAC} \Rightarrow VO = 18\sqrt{2} \text{ cm}$;
- b) $\mathcal{A}_t = 1296 \text{ cm}^2$; $\mathcal{V} = 1944\sqrt{2} \text{ cm}^3$;
- c) Dacă $VM \perp BC$ și $VN \perp AD \Rightarrow \sphericalangle((VAD), (VBC)) = \sphericalangle MVN$;
- $$\frac{MN \cdot VO}{2} = \frac{VM \cdot VN \cdot \sin(\sphericalangle MVN)}{2} \Rightarrow \sin(\sphericalangle MVN) = \frac{4\sqrt{2}}{9} \Rightarrow \cos(\sphericalangle MVN) = \frac{7}{9}$$
- d) $d(O, (VBC)) = OQ$, unde $OQ \perp VM$, $OQ = 6\sqrt{2} \text{ cm}$.

Test de autoevaluare – p. 119

- I.** 1. $999\sqrt{3} \text{ cm}^3$.
2. $8\sqrt{2} \text{ cm}$.
3. $\frac{4\sqrt{3}}{3} \text{ cm}$.
4. 4 cm .
5. $936\sqrt{3} \text{ cm}^3$.
6. $228\sqrt{3} \text{ cm}^3$.

- II.** 1. D. 2. C. 3. D. 4. D.

- III. 1.** a) Dacă $m(\sphericalangle A'AD) = 60^\circ \Rightarrow \Delta VAD$ este echilateral; dacă $VM \perp AD \Rightarrow VM = 9\sqrt{6} \text{ cm}$ și $VO = 18 \text{ cm} \Rightarrow A'D' = 6\sqrt{2} \text{ cm}$;
- b) $a_{\text{tr}} = 6\sqrt{6} \text{ cm}$;
- c) $\mathcal{A}_t = 478\sqrt{3} \text{ cm}^2$; $\mathcal{V} = 3744 \text{ cm}^3$;
- d) $\mathcal{A}_t \text{ piramidă} = 648\sqrt{3} \text{ cm}^2$; $\mathcal{V}_{\text{piramidă}} = 3888 \text{ cm}^3$.
- 2.** a) $a_{\text{tr}} = 4\sqrt{3} \text{ cm}$;
- b) $OO' = 3\sqrt{5} \text{ cm}$;
- c) $\mathcal{V} = 171\sqrt{15} \text{ cm}^3$;
- d) $\mathcal{A}_t \text{ piramidă} = 324\sqrt{3} \text{ cm}^2$; $\mathcal{V}_{\text{piramidă}} = 243\sqrt{15} \text{ cm}^3$.

Test de autoevaluare – p. 127

- I.** 1. $208\pi \text{ cm}^2$.
2. 16 cm.
3. $1458\pi \text{ cm}^3$.
4. $256\pi \text{ cm}^3$.
5. 9 cm.
6. $600\pi \text{ cm}^2$.
- II.** 1. C. 2. D. 3. A. 4. B.
- III.** 1. a) $R = 6 \text{ cm}$; $G = 12 \text{ cm}$;
b) $432\pi \text{ cm}^3$;
2. a) $R = 18 \text{ cm}$; $G = 30 \text{ cm}$; $\mathcal{V} = 2592 \text{ cm}^3$; $\mathcal{A}_t = 864\pi \text{ cm}^2$;
b) 216° ;
c) 14,06%.

Test de autoevaluare – p. 133

- I.** 1. $G = 5 \text{ cm}$.
2. 36 cm.
3. $576\sqrt{3}\pi \text{ cm}^3$.
4. $1080\pi \text{ cm}^2$.
5. 10 cm.
6. 9 cm.
- II.** 1. A. 2. B. 3. C. 4. D.
- III.** 1. a) $\mathcal{A}_t = 144\pi \text{ cm}^2$; $\mathcal{V} = 128\pi \text{ cm}^3$;
b) $\mathcal{A}_{l_{tr.}} = 108\pi \text{ cm}^2$.
2. a) $3536\pi \text{ cm}^2$; $\mathcal{V} = 14976\pi \text{ cm}^3$;
b) $\mathcal{A}_l = 2000\pi \text{ cm}^2$; $\mathcal{V} = 16000\pi \text{ cm}^3$;
c) $u^\circ = 288^\circ$.