

O.L.M. - 18.02.2012

CLASA a VII-a

Barem de corectare

### Subiectul 1

$$a = \sqrt{2} + \sqrt{2^2} + \sqrt{2^3} + \dots + \sqrt{2^{99}} \text{ se înmulțește relația cu } \sqrt{2} \dots 1p$$

$$\sqrt{2}a = \sqrt{2^2} + \sqrt{2^3} + \dots + \sqrt{2^{100}} \text{ se scad relațiile} \dots 1p$$

$$\Rightarrow a(\sqrt{2} - 1) = \sqrt{2^{100}} - \sqrt{2}$$

$$a(\sqrt{2} - 1) = 2^{50} - \sqrt{2} \dots 2p$$

$$a(\sqrt{2} - 1) = b \Rightarrow \frac{b}{a} = \sqrt{2} - 1 \dots 2p$$

$$0 < \frac{b}{a} < 1 \Rightarrow \left[ \frac{b}{a} \right] = 0 \dots 1p$$

### Subiectul 2

a) Pentru  $x = -1$  și  $n = 2$

$$A = 3 - 2\sqrt{2} + 1 - \sqrt{2} - 1 = 3 - 2\sqrt{2} + \sqrt{2} + 1 = 4 - \sqrt{2} \dots 2p$$

$$4 - \sqrt{2} > 2 \dots 1p$$

b)  $A = |2 - x| - 2\sqrt{n}|x| + |\sqrt{n}x - 1| \dots 1p$

pentru  $x < 0 \Rightarrow A = 2 - x - 2\sqrt{n}(-x) + 1 - \sqrt{n}x =$

$$= 3 + x(\sqrt{n} - 1) \dots 2p$$

$$3 + x(\sqrt{n} - 1) = 3 \quad \forall x < 0$$

$$\left. \begin{array}{l} x(\sqrt{n} - 1) = 0 \\ x < 0 \end{array} \right\} \Rightarrow \sqrt{n} - 1 = 0 \Rightarrow \sqrt{n} = 1$$

$$\Downarrow \\ n = 1 \dots 1p$$

Subiectul 3

$$m(\sphericalangle ABC) = 2x. \quad m(\sphericalangle EAB) = x + 45^\circ \text{ (ext. } \triangle ABD) \text{ ..... (2p)}$$

$$m(\sphericalangle EBA) = 90^\circ - 2x \text{ ..... (1p)}$$

$$\hat{m} \triangle EBA : m(\sphericalangle EAB) = x + 45^\circ \text{ ..... (3p)}$$

$$\triangle EBA \text{ isoscel, de bază [AE] ..... (1p)}$$

Subiectul 4.

$$\text{Observă } OA_1 = OB_1 = OC_1 = 2R_1 (= 2OA) \text{ ..... (2p)}$$

$$\triangle A_1OB_2 \equiv \triangle C_1OB_2 \equiv \dots \equiv \triangle A_1OC_2 \text{ (6 triunghiuri) (L.L.L.) ..... (2p)}$$

$$m(\sphericalangle A_1OB_2) = m(\sphericalangle B_2OC_1) = \dots = m(\sphericalangle C_2OA_1) = 60^\circ \text{ ..... (2p)}$$

$$\triangle AOC \equiv \triangle COB \equiv \triangle BOA \text{ (L.U.L.)} \Rightarrow AB = AC = BC \text{ ..... (1p)}$$