

**SHEMA ZA BODOVANJE**

STRUČNI ISPIT, **MATEMATIKA**

26. 01. 2018.

**Rješenja zadatka višestrukog izbora**

| Broj zadatka | Tačna alternativa |
|--------------|-------------------|
| 1.           | D                 |
| 2.           | A                 |
| 3.           | C                 |
| 4.           | A                 |
| 5.           | B                 |
| 6.           | D                 |
| 7.           | B                 |
| 8.           | D                 |

**9. Ukupno 3 boda**

a)  $\frac{7}{3}$  ..... 1 bod

b)  $a^x(a-1)$  ..... 1 bod

c)  $\frac{a-b}{a^2+ab+b^2}$  ..... 1 bod

**10. Ukupno 2 boda**

$(x+1)^2 - x^2 = 35$  ..... 1 bod

$x=17, \quad x+1=18$  ..... 1 bod

**11. Ukupno 3 boda**

$11^{2x^2-2x} = 11^{8-2x}$  ..... 1 bod

$2x^2 - 8 = 0$  ..... 1 bod

$x = -2 \vee x = 2$  ..... 1 bod

**12. Ukupno 4 boda**

a)  $x+1 > 0 \Rightarrow x > -1$  ..... 1 bod

b)  $x=0 \Rightarrow y=1+\log_2 1=1, \quad (0,1)$  ..... 1 bod

c)  $y=0 \Rightarrow \log_2(x+1)=-1$  ..... 1 bod

$x+1=2^{-1} \Rightarrow x=-\frac{1}{2}, \quad \left(-\frac{1}{2}, 0\right)$  ..... 1 bod

**13. Ukupno 4 boda**

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**I način**

$$\frac{\sin^2 15^\circ + \cos^2 15^\circ}{\sin 15^\circ \cdot \cos 15^\circ} \dots\dots\dots 1 \text{ bod}$$

$$\frac{1}{\sin 15^\circ \cdot \cos 15^\circ} \text{ (prepoznat osnovni trigonometrijski identitet) } \dots\dots\dots 1 \text{ bod}$$

$$\frac{2}{\sin 30^\circ} \text{ (primijena formule za dvostruki ugao) } \dots\dots\dots 1 \text{ bod}$$

4 ..... 1 bod

**II način**

$$\sqrt{\frac{1 - \cos 30^\circ}{1 + \cos 30^\circ}} + \sqrt{\frac{1 + \cos 30^\circ}{1 - \cos 30^\circ}} \text{ (primijena formule za pola ugla) } \dots\dots\dots 1 \text{ bod}$$

$$\cos 30^\circ = \frac{\sqrt{3}}{2} \dots\dots\dots 1 \text{ bod}$$

$$\frac{(\sqrt{2 - \sqrt{3}})^2 + (\sqrt{2 + \sqrt{3}})^2}{\sqrt{2 + \sqrt{3}} \cdot \sqrt{2 - \sqrt{3}}} \dots\dots\dots 1 \text{ bod}$$

4 ..... 1 bod

**14. Ukupno 2 boda**

$\square ACM = \gamma$  kao unakrsni uglovi ..... 1 bod

Iz  $\triangle ABC$  slijedi:  $2\gamma + 24^\circ = 90^\circ \Rightarrow \gamma = 33^\circ$  ..... 1 bod

**15. Ukupno 3 boda**

$$V = \frac{1}{3} \pi H (r_1^2 + r_1 r_2 + r_2^2) \Rightarrow V = \frac{1}{3} \pi H \cdot 441 \dots\dots\dots 1 \text{ bod}$$

$$r^2 \pi H = \frac{1}{3} \pi H \cdot 441 \dots\dots\dots 1 \text{ bod}$$

$$r^2 = 147 \Rightarrow r = 7\sqrt{3} \dots\dots\dots 1 \text{ bod}$$

**16. Ukupno 3 boda**

a)  $O(4, 2)$  ..... 1 bod

b)  $d(O, AB) = 1$  ..... 1 bod

c)  $d(A, C) = 2\sqrt{5}$  ili  $d(B, D) = 2\sqrt{5}$  ..... 1 bod

**17. Ukupno 3 boda**

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**I način:**

Označimo odsječak na  $x$ -osi sa  $a$ , tada je odsječak na  $y$ -osi  $a\sqrt{3}$ .

$$\frac{x}{a} + \frac{y}{a\sqrt{3}} = 1 \Rightarrow \sqrt{3}x + y - a\sqrt{3} = 0 \dots\dots\dots 1 \text{ bod}$$

$$d(O, p) = \left| \frac{-a\sqrt{3}}{2} \right| = 3 \Rightarrow a = 2\sqrt{3} \dots\dots\dots 1 \text{ bod}$$

$$\sqrt{3}x + y - 6 = 0 \dots\dots\dots 1 \text{ bod}$$

**II način:**

$$k = \operatorname{tg} 120^\circ = -\sqrt{3}, \quad y = -\sqrt{3}x + n, \quad \sqrt{3}x + y - n = 0 \dots\dots\dots 1 \text{ bod}$$

$$d(O, p) = \left| \frac{-n}{2} \right| = 3 \Rightarrow n = 6 \dots\dots\dots 1 \text{ bod}$$

$$\sqrt{3}x + y - 6 = 0 \dots\dots\dots 1$$

bod

**III način:**

segmentni oblik  $\frac{x}{a} + \frac{y}{b} = 1$

$$\cos 30^\circ = \frac{3}{a} \Rightarrow a = \frac{6}{\sqrt{3}} \text{ ili } 2\sqrt{3} \dots\dots\dots 1 \text{ bod}$$

$$\sin 30^\circ = \frac{3}{b} \Rightarrow b = 6 \dots\dots\dots 1 \text{ bod}$$

$$\frac{x}{\frac{6}{\sqrt{3}}} + \frac{y}{6} = 1 \text{ ili } \sqrt{3}x + y - 6 = 0 \dots\dots\dots 1 \text{ bod}$$

**18. Ukupno 3 boda**

$$y = -x - 1 \Rightarrow k = -1 \wedge n = -1 \dots\dots\dots 1 \text{ bod}$$

$$\begin{cases} \frac{b}{a} = \frac{\sqrt{3}}{2} \\ a^2 - b^2 = 1 \end{cases} \dots\dots\dots 1 \text{ bod}$$

$$a^2 = 4, b^2 = 3 \Rightarrow \frac{x^2}{4} - \frac{y^2}{3} = 1 \dots\dots\dots 1 \text{ bod}$$

**19. Ukupno 3 boda**

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$a_2 = a_1 q \Rightarrow 3 \cdot (-2)^{2-1} = 3 \cdot (-2)^{1-1} q$  ..... 1 bod

$q = -2$  ..... 1 bod

$a_5 = 3 \cdot (-2)^4 = 48$  ..... 1 bod

**20. Ukupno 3 boda**

$f'(x) = \frac{(x-2)'(x-4) - (x-2)(x-4)'}{(x-4)^2}$  ..... 1 bod

$f'(x) = \frac{-2}{(x-4)^2}$  ..... 1 bod

$f'(x) < 0$ , znači, funkcija je uvijek opadajuća ..... 1 bod