UPUTSTVO ZA OCJENJIVANJE

MATURSKI/STRUČNI ISPIT – MATEMATIKA (VIŠI NIVO)

24. 05. 2024. GODINA

Rješenja zadataka višestrukog izbora

Redni broj zadatka	Tačan odgovor
1.	**D**
2.	**C**
3.	**B**
4.	**D**
5.	**A**
6.	**C**
7.	**C**
8.	**B**
9.	**B**
10.	**D**

11.

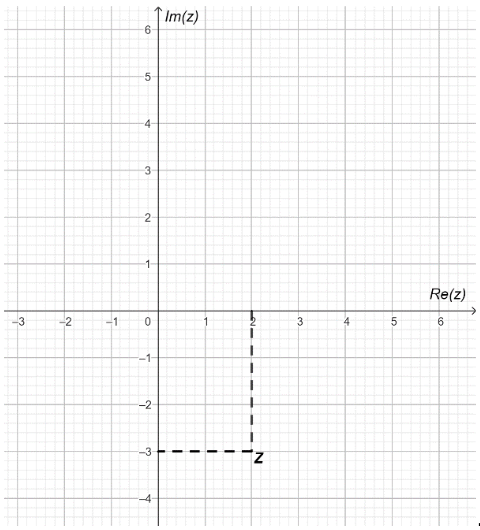
$2x^2+12x+18=2(x+3)^2$ ili $2x^2-18=2(x+3)(x-3)$ .... 1 bod

$\frac{2x^2+12x+18}{2x^2-18}=\frac{2(x+3)^2}{2(x-3)(x+3)}=\frac{x+3}{x-3}$ .... 1 bod

12.

$z=\frac{3+2i}{i}\cdot\frac{i}{i}$ .... 1 bod

$z=2-3i$ .... 1 bod



.... 1 bod

13.

$$\begin{cases} 2x^2+2y^2+3y-2=0 \\ -2x+y+2=0 \end{cases}$$

$2x^2+2(2x-2)^2+3(2x-2)-2=0$ .... 1 bod

$2x^2+8x^2-16x+8+6x-8=0 \Rightarrow 10x^2-10x=0$ .... 1 bod

$10x^2-10x=0 \Rightarrow x(x-1)=0 \Rightarrow x=0 \vee x=1$ .... 1 bod

$(0,-2),(1,0)$ .... 1 bod

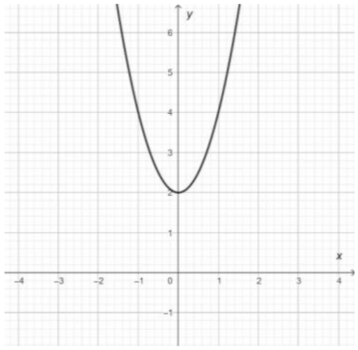
14.

$a=2k, \quad b=1-k, \quad c=3-k$

$T(\alpha,\beta), \alpha=-\dfrac{b}{2a}=0$ .... 1 bod

$1-k=0 \Rightarrow k=1$

$y=2x^2+2$ .... 1 bod



.... 1 bod

15.

$\log\frac{200}{2}+98=10^x$ .... 1 bod

$100=10^x$ .... 1 bod

$x=2$ .... 1 bod

16.

$\sin 4\alpha=2\sin 2\alpha\cos 2\alpha$ .... 1 bod

$\cos^4\alpha-\sin^4\alpha=\left(\cos^2\alpha-\sin^2\alpha\right)\left(\cos^2\alpha+\sin^2\alpha\right)=\cos^2\alpha-\sin^2\alpha$ .... 1 bod

$$\frac{\sin 4\alpha}{\cos^4\alpha-\sin^4\alpha}=\frac{2\sin 2\alpha\left(\cos^2\alpha-\sin^2\alpha\right)}{\left(\cos^2\alpha-\sin^2\alpha\right)\left(\cos^2\alpha+\sin^2\alpha\right)}=\frac{2\sin 2\alpha}{\cos^2\alpha+\sin^2\alpha}=4\sin\alpha\cos\alpha$$

.... 1 bod

17.

$p: k=tg45^o=1,\ (-3,0)\in p$

$y-0=1\cdot(x+3)\Rightarrow y=x+3$ .... 1 bod

$q: k=tg135^o=-1,\ (-3,0)\in q$

$y-0=-1\cdot(x+3)\Rightarrow y=-x-3$ .... 1 bod

18.

$V_{kocke}=(4cm)^3=64cm^3$ .... 1 bod

Ivice kvadra: $a:b:c=1:2:4\Rightarrow a=k, b=2k, c=4k$ .... 1 bod

$V_{kocke}=V_{kvadra}=64cm^3\Rightarrow 8k^3=64\Rightarrow k^3=8\Rightarrow k=2$ .... 1 bod

$P_{kvadra}-P_{kocke}=2(2\cdot4+2\cdot8+4\cdot8)-6\cdot16=16cm^2$ .... 1 bod

19.

Presjek dijagonala je tačka $O(-1,3)$ koja je središte duži AC odnosno BD.... 1 bod

$k_{AC}=\frac{6-0}{-2-0}=-3$ .... 1 bod

$k_{BD}=k_{BO}=\frac{2-3}{-\frac{3}{2}+1}=2$ .... 1 bod

$tg\varphi = \left| \frac{-3-2}{1-6} \right| = 1$ .... 1 bod

$\varphi = 45^o$ .... 1 bod

20.

$x - 2y - 5 = 0 \Rightarrow y = \frac{1}{2}x - \frac{5}{2} \Rightarrow k = \frac{1}{2}, n = -\frac{5}{2}$ .... 1 bod

Uslov dodira: $r^2\left(k^2+1\right) = n^2$

$r^2\left(k^2+1\right) = n^2 \Rightarrow r^2\left(\left(\frac{1}{2}\right)^2 + 1\right) = \left(-\frac{5}{2}\right)^2 \Rightarrow r^2 = 5$ .... 1 bod

$x^2 + y^2 = r^2 \Rightarrow x^2 + y^2 = 5$ .... 1 bod

21.

$a_1 = 5p, a_2 = 20, a_3 = 3p$

$a_3 - a_2 = a_2 - a_1$ .... 1 bod

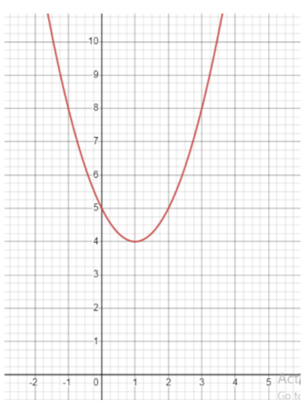
$3p - 20 = 20 - 5p \Rightarrow 8p = 40 \Rightarrow p = 5$ .... 1 bod

$a_1 = 25, a_2 = 20, a_3 = 15$

$d = -5$ .... 1 bod

22.

$f'(x) = 3x^2 - 6x + 15$ .... 1 bod



.... 1 bod

$f'(x) > 0$ za $x \in R \Rightarrow f(x)$ je rastuća za svako $x \in R$ .... 1 bod

23.

$x_1^{\,2}+x_2^{\,2}=\left(x_1+x_2\right)^2-2x_1x_2$ .... 1 bod

$x_1+x_2=2\left(5-m\right)$, $x_1x_2=m^2-6$ .... 1 bod

$\left(2\left(5-m\right)\right)^2-2\left(m^2-6\right)>10\Rightarrow m^2-20m+51>0$ .... 1 bod

$m_1=3, m_2=17$ .... 1 bod

$m\in\left(-\infty,3\right)\cup\left(17,+\infty\right)$ .... 1 bod

24.

$C\left(x,x-2\right)$ .... 1 bod

$P=\frac{1}{2}\left|1\left(5-\left(x-2\right)\right)+0+x\left(0-5\right)\right|$ .... 1 bod

$\left|7-6x\right|=11$ .... 1 bod

$7-6x=11$ za $x\le\frac{7}{6}\Rightarrow x=-\frac{2}{3}$ nije rješenje jer tačka iz prvog kvadranta ima pozitivnu apscisu .... 1 bod

$7-6x=-11$ za $x>\frac{7}{6}\Rightarrow x=3, y=1, C\left(3,1\right)$ .... 1 bod

25.

$\lim\limits_{x\to3}\frac{\sqrt{x+3}-\sqrt{2x}}{x^2-3x}=\lim\limits_{x\to3}\frac{\sqrt{x+3}-\sqrt{2x}}{x^2-3x}\cdot\frac{\sqrt{x+3}+\sqrt{2x}}{\sqrt{x+3}+\sqrt{2x}}$ .... 1 bod

$\lim\limits_{x\to3}\frac{3-x}{x(x-3)}\cdot\frac{1}{\sqrt{x+3}+\sqrt{2x}}$ .... 1 bod

$\lim\limits_{x\to3}\frac{-1}{x(\sqrt{x+3}+\sqrt{2x})}=-\frac{\sqrt{6}}{36}$ .... 1 bod

26.

Iz uslova zadatka se dobija jednačina $(n+2)! = 90 \cdot n!$ .... 1 bod

$(n+2)(n+1) = 90 \Rightarrow n^2 + 3n - 88 = 0$ .... 1 bod

$n_{1,2} = \frac{-3 \pm \sqrt{361}}{2} = \begin{cases} 8, \\ -11 < 0 \end{cases}$ pa je $n = 8$ .... 1 bod