

### ТРИГОНОМЕТРИСКИ ОБЛИК КОМПЛЕКСНОГ БРОЈА

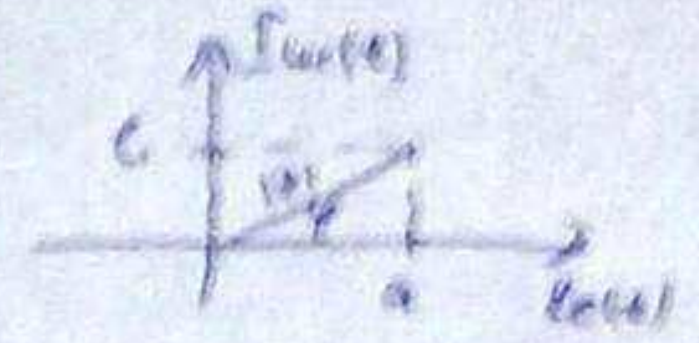
$z = a + bi$  ТРИГ ОБЛИК  $z = r \cdot (\cos \varphi + i \sin \varphi)$

ГДЕ ЈЕ  $r = |z| = \sqrt{a^2 + b^2}$  - МОДУЛ

$\varphi$  - АРГУМЕНТ

$\cos \varphi = \frac{a}{r}$  ;  $\sin \varphi = \frac{b}{r}$

$0 \leq \varphi < 2\pi$  ;  $\operatorname{tg} \varphi = \frac{b}{a}$

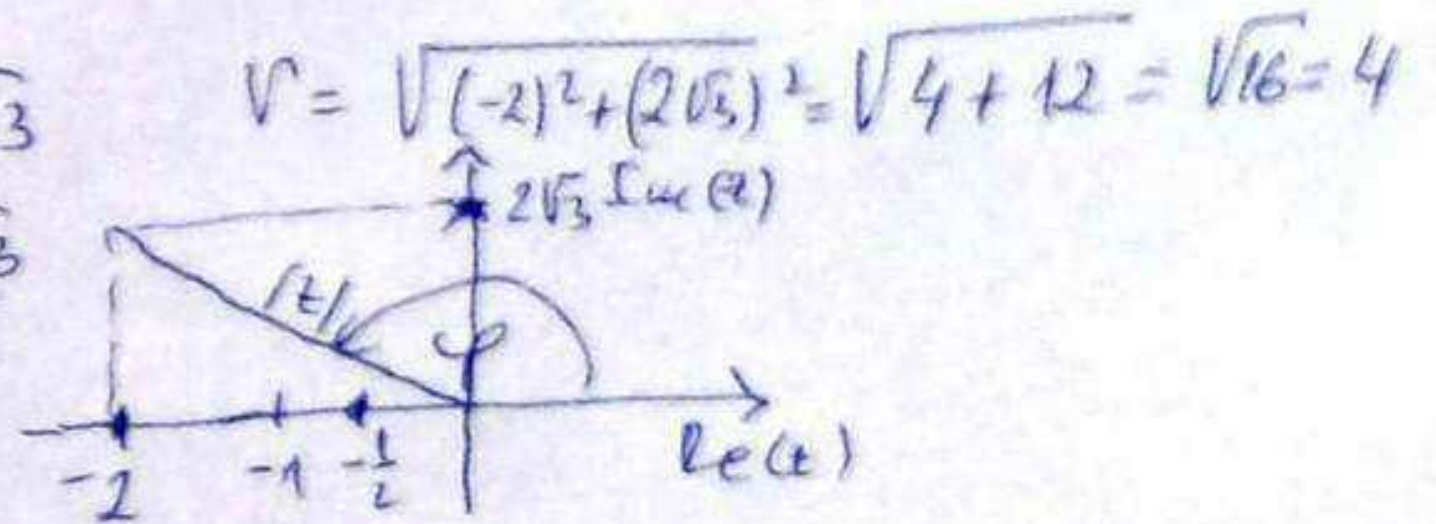


1.  $z_1 \cdot z_2 = r_1 \cdot r_2 (\cos(\varphi_1 + \varphi_2) + i \sin(\varphi_1 + \varphi_2))$       $z_1 = r_1 (\cos(\varphi_1) + i \sin(\varphi_1))$
2.  $\frac{z_1}{z_2} = \frac{r_1}{r_2} (\cos(\varphi_1 - \varphi_2) + i \sin(\varphi_1 - \varphi_2))$       $z_2 = r_2 (\cos(\varphi_2) + i \sin(\varphi_2))$
3. МОАВРОВА ФОРМУЛА  $z^n = (r(\cos \varphi + i \sin \varphi))^n = r^n (\cos n\varphi + i \sin n\varphi)$
4.  $\sqrt[n]{z} = W_k = \sqrt[n]{r} \left( \cos \frac{\varphi + 2k\pi}{n} + i \sin \frac{\varphi + 2k\pi}{n} \right)$  ;  $k = 0, 1, 2, \dots, (n-1)$

1269 б)  $z = -2 + 2\sqrt{3}i$  ;  $a = -2$  ;  $b = 2\sqrt{3}$

$\cos \varphi = -\frac{2}{4} = -\frac{1}{2}$       $\sin \varphi = \frac{2\sqrt{3}}{4} = \frac{\sqrt{3}}{2}$

$\varphi = 120^\circ = \frac{\pi}{2} + \frac{\pi}{6} = \frac{4\pi}{6} = \frac{2\pi}{3}$



$z = 4 \cdot \left( \cos \frac{2\pi}{3} + i \sin \frac{2\pi}{3} \right)$

1274 а)  $z^6 = ?$       $z = \cos \frac{\pi}{6} + i \sin \frac{\pi}{6}$

$z^6 = \left( \cos \frac{\pi}{6} + i \sin \frac{\pi}{6} \right)^6 = \cos 6 \cdot \frac{\pi}{6} + i \sin 6 \cdot \frac{\pi}{6} = \cos \pi + i \sin \pi = -1$

1275 а)  $z^4 = i$       $r = \sqrt{0^2 + 1^2} = 1$  ;  $a = 0$  ,  $b = 1$       $\cos \varphi = \frac{0}{1} = 0$  ;  $\sin \varphi = \frac{1}{1} = 1$

$z = \cos \frac{\pi}{2} + i \sin \frac{\pi}{2}$

$z_k = \sqrt[4]{1} \left( \cos \left( \frac{\frac{\pi}{2} + 2k\pi}{2} \right) + i \sin \left( \frac{\frac{\pi}{2} + 2k\pi}{2} \right) \right)$

ЗА  $k = 0$       $z_0 = \cos \frac{\pi}{4} + i \sin \frac{\pi}{4} = \frac{\sqrt{2}}{2} + i \frac{\sqrt{2}}{2}$

ЗА  $k = 1$       $z_1 = \cos \left( \frac{\pi}{4} + \pi \right) + i \sin \left( \frac{\pi}{4} + \pi \right) = \cos \frac{5\pi}{4} + i \sin \frac{5\pi}{4} = -\frac{\sqrt{2}}{2} + i \left(-\frac{\sqrt{2}}{2}\right)$

### ЧЕТВРТИ ПИСМЕНИ

1. Доказати  $1 + 3 + 6 + \dots + \frac{n(n+1)}{2} = \frac{n(n+1)(n+2)}{6}$
2. А - низ  $d = ?$   $a_1 = ?$       $a_2 + a_5 - a_3 = 10$  ;  $a_2 + a_9 = 17$
3. 3 броја чине геометрички збир њихов је 65. Ако средњи увећамо за 10, низ постаје аритметички. Одредити тај низ.
4.  $\lim_{n \rightarrow \infty} \frac{(n+1)^3 - (n-1)^3}{(n+1)^2 + (n-1)^2}$
5.  $(1+i)^{25} = ?$