M-6 Modul kompleksnog broja $z \neq 0$ koji zadovoljava uvjete $|z+1| = |z+i| = 1$ iznosi

A. 1 B. $\frac{1}{\sqrt{2}}$ C. $\frac{1}{\sqrt{3}}$ D. $\sqrt{2}$ E. $\sqrt{3}$

$z = x + yi$

$|z+1| = |z+i| = 1$ To su ustvari dvije jednadžbe:

$\swarrow \qquad \searrow$

$\lvert z+1\rvert = 1$	i	$\lvert z+i\rvert = 1$
$\lvert x+yi+1\rvert = 1$		$\lvert x+yi+i\rvert = 1$
$\lvert (x+1)+yi\rvert = 1$		$\lvert x+(y+1)i\rvert = 1 \qquad \lvert z\rvert = \sqrt{\mathrm{Re}^2+\mathrm{Im}^2}$
$\sqrt{(x+1)^2+y^2} = 1 \quad /^2$		$\sqrt{x^2+(y+1)^2} = 1 \quad /^2$
$(x+1)^2+y^2 = 1$		$x^2+(y+1)^2 = 1$
$x^2+2x+1+y^2-1 = 0$		$x^2+y^2+2y+1-1 = 0$
$x^2+2x+y^2 = 0$		$x^2+2y+y^2 = 0$

sada rješimo sustav ove dvije jednadžbe:

$$x^2+2x+y^2 = 0 \quad /\cdot(-1)$$
$$\underline{x^2+2y+y^2 = 0}$$
$$\left.\begin{array}{r} -x^2-2x-y^2 = 0 \\ x^2+2y+y^2 = 0 \end{array}\right\} +$$
$$2y-2x = 0$$
$$2y = 2x$$
$$y = x \quad \rightarrow \quad x^2+2x+y^2 = 0$$
$$x^2+2x+x^2 = 0$$
$$2x^2+2x = 0$$
$$2x\cdot(x+1) = 0$$
$$2x = 0 \qquad x+1 = 0$$
$$x = 0 \qquad x = -1$$
$$y = x$$
$$y = 0 \qquad y = -1$$

varijanta sa: $x = 0,\ y = 0$ otpada

zbog zadanog: $z \neq 0$ $\qquad x = -1\ ,\ y = -1$ su rješ.

$$z = x + yi$$
$$z = -1 - 1i$$

Traži se modul kompleksnog broja z, $|z| = ?$

$$|z| = \sqrt{x^2+y^2}$$
$$|z| = \sqrt{(-1)^2+(-1)^2} = \sqrt{1+1}$$
$$|z| = \sqrt{2}$$