1. The $x + iy$ form of $\frac{1+i}{\sqrt{2}}$, when $x, y \in R$ is

□ $\frac{2i+1}{\sqrt{2}}$

□ $\frac{2i-1}{\sqrt{2}}$

□ $\frac{1-i}{\sqrt{2}}$

☑ $\frac{1+i}{\sqrt{2}}$

2. Find the four roots of the polynomial $z^4 + 16$.

□ $e^{\frac{i\pi}{4}}$ $e^{\frac{3i\pi}{4}}$ $e^{\frac{5i\pi}{4}}$ $e^{\frac{7i\pi}{4}}$

□ $2e^{\frac{i\pi}{3}}2$ $e^{i\pi}2$ $e^{\frac{5i\pi}{3}}2$ $e^{\frac{7i\pi}{3}}$

□ $2e^{\frac{i\pi}{4}}2$ $e^{\frac{i\pi}{2}}2$ $e^{5i\pi}2$ $e^{2i\pi}$

☑ $2e^{\frac{i\pi}{4}}2$ $e^{\frac{3i\pi}{4}}2$ $e^{\frac{5i\pi}{4}}2$ $e^{\frac{7i\pi}{4}}$

3. Find the principal argument and exponential form of $z = \sqrt{3} + i$.

□ $\mathrm{Arg}(z) = \frac{\pi}{3}$ and $z = 2e^{\frac{i\pi}{3}}$

□ $\mathrm{Arg}(z) = \frac{\pi}{4}$ and $z = 2e^{\frac{i\pi}{4}}$

□ $\mathrm{Arg}(z) = \frac{2\pi}{3}$ and $z = 2e^{\frac{2i\pi}{3}}$

☑ $\mathrm{Arg}(z) = \frac{\pi}{6}$ and $z = 2e^{\frac{i\pi}{6}}$

4. $|\log(z)| \leq |\ln\ |z|| + \pi$ for all $z \neq 0$.

☑ True

□ False

5. Find the complex solutions of $\mathrm{conj}(z) + z = 0$.

□ $\mathrm{Im}(z) = 1$

☑ $\mathrm{Re}(z) = 0$

□ $\mathrm{Im}(z) = 0$

□ $\mathrm{Re}(z) = 1$