1. The smallest positive integer n for which $\left(\frac{1+i}{1-i}\right)^{n}=1$, is

2. If the real part of the complex number $z=\frac{3+2 i \cos \theta}{1-3 i \cos \theta}, \theta \in\left(0, \frac{\pi}{2}\right)$ is zero, then the value of $\sin ^{2} 3 \theta+\cos ^{2} \theta$ is equal to ______.

3. If $\left|\frac{z-25}{z-1}\right|=5$, find the value of $|z|$

(1) 3
(2) 4
(3) 5
(4) 6

4. If $\frac{z-\alpha}{z+\alpha}$ is purely imaginary and $|z|=82$ then α is $(\alpha \in R)$

(1) 2
(2) 4
(3) 3
(4) 1

5. The region represented by $\{z=x+i y \in C:|z|-\operatorname{Re}(z) \leq 1\}$ is also given by the inequality

(1) $y^{2} \geq 2(x+1)$
(2) $y^{2} \leq 2\left(x+\frac{1}{2}\right)$
(3) $y^{2} \leq\left(x+\frac{1}{2}\right)$
(4) $y^{2} \geq x+1$

6. The principal argument of the complex number $\frac{(1+i)^{5}\left(1+\sqrt{3} i\right)^{2}}{-2 i\left(-\sqrt{3}+i\right)}$ is

(1) $\frac{19 \pi}{12}$
(2) $-\frac{7 \pi}{12}$
(3) $-\frac{5 \pi}{12}$
(4) $\frac{5 \pi}{12}$

7. If $(1+i)(1+2 i)(1+3 i) \ldots . .(1+n i)=\alpha+i \beta$, then $2 . 5 . 10 \ldots \ldots\left(1+n^{2}\right)=$

(1) $\alpha-i \beta$
(2) $\alpha^{2}-\beta^{2}$
(3) $\alpha^{2}+\beta^{2}$
(4) None of these

8. If z_{1} and z_{2} are two complex numbers such that $\left|z_{1}\right|=\left|z_{2}\right|+\left|z_{1}-z_{2}\right|, \left|z_{1}\right|>\left|z_{2}\right|,$ then

(1) $Im\left(\frac{z_{1}}{z_{2}}\right)=0$
(2) $Re\left(\frac{z_{1}}{z_{2}}\right)=0$
(3) $Re\left(\frac{z_{1}}{z_{2}}\right)=Im\left(\frac{z_{1}}{z_{2}}\right)$
(4) $Im\left(\frac{z_{1}}{z_{2}}\right)=1$

9. The equation $z^{2}=\bar{z}$ has

(1) No solution
(2) Two solutions
(3) Four solutions
(4) An infinite number of solutions

10. The complex number which satisfy the equation $z+\sqrt{2}|z+1|+i=0$ is

(1) $4-i$
(2) $4+i$
(3) $-2-i$
(4) $2+i$