1) Find the coordinates of the point which represents $\frac{3+4i}{1-2i}$ in the Argand plane.

(a) $-2+3i$ (b) $2+3i$

(c) $-2-3i$ (d) $-1+2i$

2) For the complex number $z=\sqrt{3}-i$, find $\arg z$.

(a) $\frac{\pi}{6}$ (b) $\frac{\pi}{3}$

(c) $\frac{\pi}{2}$ (d) $-\frac{\pi}{6}$

3) Given $\omega=3-4i$, express $\sqrt{\omega}$ in the form $a+ib$ (for real a and b).

(a) $\pm(2+i)$ (b) $2-i$

(c) $\pm(2-i)$ (d) $\pm(3+i)$

4) Solve the equation $z^2-4iz-3=0$.

(a) $3i,i$ (b) $-3i,i$

(c) $3i,-i$ (d) $-3i,-i$

5) Given that $z=1-2i$ is a zero of the real polynomial $P(z)=z^3-az^2+bz-20$, find the values of a and b.

(a) $a=12,b=8$ (b) $a=6,b=13$

(c) $a=7,b=21$ (d) $a=11,b=8$

6) Given $z_1=1-i$ and $z_2=-1+\sqrt{3}i$, find the exact value of $|z_1z_2|$.

(a) $\sqrt{2}$ (b) $\sqrt{3}$

(c) $2\sqrt{2}$ (d) $2\sqrt{3}$

7) Find one of the cube roots of $8cis(\frac{\pi}{2})$.

(a) $2cis(\frac{\pi}{6})$ (b) $2cis(\frac{\pi}{3})$

(c) $cis(\frac{\pi}{6})$ (d) $cis(\frac{\pi}{3})$

8) If $2-i$ is a root of the equation $z^4-5z^3+3z^2+19z-30$, find one of the other roots.

(a) 4 (b) $i-2$

(c) 3 (d) 2

9) Determine z such that $|z+3i|=|z+5-2i|$ and $|z-4i|=|z+2i|$.

(a) $-1+i$ (b) $1+i$

(c) $-1-i$ (d) $1-i$

10) Consider the locus of $z:|z-i|=\frac{1}{2}$. What is the maximum value of arg z in this locus?

(a) π (b) $\frac{2\pi}{3}$

(c) $\frac{\pi}{3}$ (d) $\frac{3\pi}{4}$

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Answers

1) d
2) d
3) c
4) a
5) b
6) c
7) a
8) c
9) a
10) b