

Assignment 6

Section 17.1 :

In Problems 1–26, write the given number in the form $a + ib$.

3. i^8

12. $(1 - i)^3$

18. $\frac{(1 + i)(1 - 2i)}{(2 + i)(4 - 3i)}$

In Problems 27–32, let $z = x + iy$. Find the indicated expression.

28. $\operatorname{Re}(z^2)$

31. $|z - 1 - 3i|$

In Problems 33–38, use Definition 17.1.2 to find a complex number z satisfying the given equation.

35. $z^2 = i$

36. $\bar{z}^2 = 4z$

In Problems 39 and 40, determine which complex number is closer to the origin.

39. $10 + 8i, 11 - 6i$

Section 17.2 :

In Problems 1–10, write the given complex number in polar form.

5. $1 + i$

8. $-2 - 2\sqrt{3}i$

In Problems 11–14, write the number given in polar form in the form $a + ib$.

11. $z = 5\left(\cos \frac{7\pi}{6} + i \sin \frac{7\pi}{6}\right)$

In Problems 21–26, use (8) to compute the indicated power.

21. $(1 + \sqrt{3}i)^9$

25. $\left(\cos \frac{\pi}{8} + i \sin \frac{\pi}{8}\right)^{12}$

In Problems 33 and 34, find all solutions of the given equation.

33. $z^4 + 1 = 0$

37. Use the result $(\cos \theta + i \sin \theta)^2 = \cos 2\theta + i \sin 2\theta$ to find trigonometric identities for $\cos 2\theta$ and $\sin 2\theta$.

38. Use the result $(\cos \theta + i \sin \theta)^3 = \cos 3\theta + i \sin 3\theta$ to find trigonometric identities for $\cos 3\theta$ and $\sin 3\theta$.