

Appendix I Complex Numbers (page xviii)

1. $\Re(z) = -5, \Im(z) = 2$
3. $\Re(z) = 0, \Im(z) = -\pi$
5. $|z| = \sqrt{2}, \theta = 3\pi/4$
7. $|z| = 3, \theta = \pi/2$
9. $|z| = \sqrt{5}, \theta = \tan^{-1} 2$
11. $|z| = 5, \theta = -\pi + \tan^{-1}(4/3)$
13. $|z| = 2, \theta = -\pi/6$
15. $|z| = 3, \theta = 4\pi/5$
17. $11\pi/12$
19. $4 + 3i$
21. $\frac{\pi\sqrt{3}}{2} + \frac{\pi}{2}i$
23. $\frac{1}{4} - \frac{\sqrt{3}}{4}i$
25. $-3 + 5i$
27. $2 + i$
29. closed disk, radius 2, centre 0
31. closed disk, radius 5, centre $3 - 4i$
33. closed plane sector lying under $y = 0$ and to the left of $y = -x$
35. 4
37. $5 - i$
39. $2 + 11i$
41. $-\frac{1}{5} + \frac{7}{5}i$
43. 1
47. $zw = -3 - 3i, \frac{z}{w} = \frac{1+i}{3}$
49. (a) circle $|z| = \sqrt{2}$, (b) no solutions
51. $-1, \frac{1}{2} \pm \frac{\sqrt{3}}{2}i$
53. $2^{1/6}(\cos \theta + i \sin \theta)$ where $\theta = \pi/4, 11\pi/12, 19\pi/12$
55. $\pm 2^{1/4} \left(\frac{\sqrt{3}}{2} + \frac{1}{2}i \right), \pm 2^{1/4} \left(\frac{1}{2} - \frac{\sqrt{3}}{2}i \right)$

Appendix II Complex Functions (page xxviii)

1. $0 \leq \Re(w) \leq 1, -2 \leq \Im(w) \leq 0$
3. $1 \leq |w| \leq 4, \pi \leq \arg w \leq \frac{3\pi}{2}$
5. $\frac{1}{2} \leq |w| < \infty, -\frac{\pi}{2} \leq \arg w \leq 0$
7. $\arg(w) = 5\pi/6$
9. parabola $v^2 = 4u + 4$
11. $u \geq 0, v \geq u$
13. $f'(z) = 2z$
15. $f'(z) = -1/z^2$
19. $\frac{d}{dz} \sinh z = \cosh z, \frac{d}{dz} \cosh z = \sinh z$
21. $z = \frac{\pi}{2} + k\pi, (k \in \mathbb{Z})$
23. zeros of $\cosh z: z = i \left(\frac{\pi}{2} + k\pi \right) (k \in \mathbb{Z})$
zeros of $\sinh z: z = k\pi i (k \in \mathbb{Z})$
25. $\Re(\sinh z) = \sinh x \cos y, \Im(\sinh z) = \cosh x \sin y$
27. $z = 0, -2i$
29. $z = -1 \pm 2i$
31. $z = 0, i, 2i$
33. $z = \frac{1 \pm i}{\sqrt{2}}, z = \frac{-1 \pm i}{\sqrt{2}}$
 $z^4 + 1 = (z^2 + \sqrt{2}z + 1)(z^2 - \sqrt{2}z + 1)$
35. $z = -1, -1, -1, i, -i$