

Problem 1

Show that

$$\oint_C (z - z_0)^n dz = 2\pi i \delta_{n,-1} ,$$

where the contour C encircles the point z_0 once in a positive (counterclockwise) sense, n is an integer, and $\delta_{n,-1}$ is the Kronecker delta function. The immensely useful calculus of residues (see Ch. 7) is based on this simple result.

Problems from Weber and Arfken:

W&A 6.3.1

W&A 6.4.4

Plus: Write a short resumé of the lectured parts of Ch. 6 (6.1–6.4).