Lecture 21: Using Cauchy integral formula

Example 1: Evaluate $\displaystyle\oint_{|z|=1} \frac{z^2}{z-2}\,dz$

Example 2: Evaluate $\displaystyle\oint_{|z|=3} \frac{z^2}{z-2}\,dz$

Example 3: Evaluate $\displaystyle\oint_{|z|=4} \frac{z\,dz}{(9-z^2)(z+i)}\,dz$

Example 4: Show that $\displaystyle\oint_C f(z)\,dz = \oint_{C_1} f(z)dz + \oint_{C_2} f(z)dz + \ldots + \oint_{C_n} f(z)dz$ if all curves are simple, closed, do not intersect, and f is analytic between C and C_k, $k = 1, \ldots, n$.