Physics/6403	Mathematical Physics	I Dr.	Ulrich Je	entschura	Fall Semester	· 2024
Missouri S & T ((Rolla, Missouri)	Exercise	Sheet 4X	ζ Thu	rsday, 12–SEP	-2024

Task 1 (30 extra points)

Given two polynomials p = p(z) and q = q(z), with $\deg(p) \ge \deg(q) + 2$, show that the sum of the residues at all poles of the rational function

$$f(z) = \frac{p(z)}{q(z)} \tag{1}$$

is zero, i.e.,

$$\sum_{i=1}^{\deg(q)} \operatorname{Res}_{z=z_i} f(z) = 0.$$
 (2)

The tasks are due Thursday, 26–SEP–2024.