

(From May, J.P., *A Concise Course in Algebraic Topology*.) Let p be a polynomial function on \mathbb{C} with no root on S^1 . Show that the number of roots of $p(z) = 0$ with $|z| < 1$ is the degree of the map $\hat{p}: S^1 \rightarrow S^1$ specified by $\hat{p}(z) = p(z)/|p(z)|$.