ANOTHER PROOF OF SPIRA’S INEQUALITY AND
ITS APPLICATION TO THE RIEMANN HYPOTHESIS

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Abstract. By using new inequalities involving powers of rational functions, we give another proof of an important Spira’s relation for the Riemann zeta-function $|\zeta(1-s)| \leq |\zeta(s)|$ in the strip $0 < \Re s < 1/2$, $|\Im s| > 12$. Moreover, we establish a sufficient condition of the validity of the Riemann hypothesis in terms of the derivative of $|\zeta(s)|^2$ with respect to $\Re s$ and conjecture its necessity.


Keywords and phrases: Riemann zeta-function, size of the Riemann zeta-function, critical strip.

REFERENCES