

A Proof of Bertrand's Postulate

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November 18, 2025

Abstract

We give an elementary proof of Bertrand's Postulate following an approach inspired by Ramanujan. Using properties of the von Mangoldt function and the Chebyshev functions, we show that $\theta(x) - \theta(x/2) > 0$ holds beyond an explicit bound and we verify the remaining cases directly. This completes the proof.

MSC Number: 11A41

Keywords: Bertrand's Postulate, the von Mangoldt function, Chebyshev functions

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References

- [1] Jaban Meher and M. Ram Murty, Ramanujan's Proof of Bertrand's Postulate. *American Mathematical Monthly*, 120 (2013)