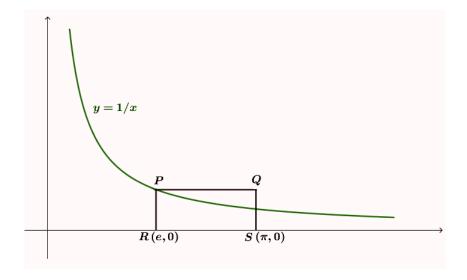# A VISUAL PROOF THAT $\pi^e < e^\pi$

BIKASH CHAKRABORTY

Claim: $\pi^e < e^\pi$.

$$\ln \pi - 1 = \int_e^\pi \frac{dx}{x} \quad < \quad \frac{1}{e}(\pi - e) = \frac{\pi}{e} - 1,$$
$$\pi^e \quad < \quad e^\pi.$$

References

[1] Fouad Nakhli, $e^\pi > \pi^e$, Mathematics Magazine, 60(3) (1987), pp. 165.
[2] Roger B. Nelsen, Proofs without Words: Exercise in Visual Thinking, The Mathematical Association of America, 1993.
[3] Roger B. Nelsen, Proofs without Words II: More Exercise in Visual Thinking, The Mathematical Association of America, 2000.

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