

A Geometric Argument For the Irrationality of Pi

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Abstract

Using tangent lines to the unit circle, we give an argument that shows π is irrational.

Theorem 1. π is irrational.

Proof. If π is rational, there exists an angle in $(\pi/2, \pi)$ such that the slope of the tangent line to the unit circle at this angle equals π , but the slope of such a line at angle π is undefined, a contradiction. \square

References

- [1] I. Niven, A simple proof that π is irrational, *Bull. Amer. Math. Soc.* **53** (1947) 509.
- [2] ———, *Irrational Numbers*, Carus Mathematical Monographs, no. 11, Mathematical Association of America, Washington, DC, 1985.