A SHORT CALCULUS PROOF OF JORDAN'S INEQUALITY

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Theorem 1. *If $0 < \alpha < \frac{\pi}{2}$, then $\sin \alpha \geq \frac{2\alpha}{\pi}$.*

If $0 < \alpha < \frac{\pi}{2}$, then

$$\int_0^1 \left(\cos \alpha x - \cos \frac{\pi x}{2} \right) dx \geq 0 \implies \frac{\sin \alpha}{\alpha} - \frac{2}{\pi} \geq 0 \implies \sin \alpha \geq \frac{2\alpha}{\pi}.$$

REFERENCES

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