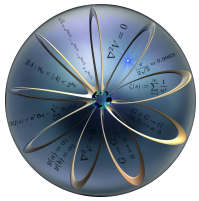

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another proof of Bernoulli's inequality

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For fixed $x > 0,\ x \neq 1$ the function

$$w_x(r) = \int_1^x t^{r-1} dt = \begin{cases} \frac{x^r - 1}{r} & r \neq 0 \\ \log x & r = 0 \end{cases}$$

is strictly increasing.
Bernoulli inequality is equivalent to

$$w_{1+x}(r) > (<)\ w_{1+x}(1)$$