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(1)

$$a(x_n)^n = a\left(\frac{a^n}{b} + \frac{b^n}{a}\right) = \frac{a^{n+1}}{b} + b^n$$

$0 < a < b$ より,

$$\frac{a^{n+1}}{b} + b^n > 0 + b^n = b^n$$

$$\frac{a^{n+1}}{b} + b^n < \frac{b^{n+1}}{b} + b^n = 2b^n$$

よって,

$$b^n < a(x_n)^n < 2b^n$$