

مقایسه ریشه ها:

برای a, b و $n \in \mathbb{N}$ و $n \neq 0$ داریم:

$$* a < b \Leftrightarrow a^n < b^n \quad \text{مثال: } 1 < 2 \Rightarrow 1^2 < 2^2 \Rightarrow 1 < 2$$

$$* a < b \Leftrightarrow \sqrt[n]{a} < \sqrt[n]{b} \quad \text{مثال: } 1 < 2 \Rightarrow \sqrt[3]{1} < \sqrt[3]{2} \Rightarrow 1 < 2$$

$$a < b \Rightarrow a^n < b^n \quad \text{و} \quad a > b \Rightarrow a^n > b^n$$

$$c = \sqrt[3]{27}, b = \sqrt[3]{125}, a = \sqrt[3]{1000}$$

$$c < b < a \quad \text{و} \quad a < c < b < a$$

$$\sqrt[3]{27} < \sqrt[3]{125} < \sqrt[3]{1000} \quad \text{و} \quad b < a < c$$

$$a < c < b \quad \text{و} \quad a < c < b$$

مثال: $m < n$ و $a < b$

$$\begin{cases} a < b \\ \sqrt[n]{a} < \sqrt[n]{b} \end{cases} \quad \text{و} \quad \begin{cases} a > b \\ \sqrt[n]{a} > \sqrt[n]{b} \end{cases}$$

مثال: $m < n$ و $a < b$

$$\begin{cases} a < b \\ \sqrt[n]{a} < \sqrt[n]{b} \end{cases} \quad \text{و} \quad \begin{cases} a > b \\ \sqrt[n]{a} > \sqrt[n]{b} \end{cases}$$

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$$c < b < a \quad \text{و} \quad a < c < b < a$$

$$\sqrt[n]{a} < \sqrt[n]{b} \quad \text{و} \quad \sqrt[n]{a} > \sqrt[n]{b}$$

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$$a^{\frac{1}{n}} = \sqrt[n]{a} \quad \text{و} \quad a^{\frac{m}{n}} = \sqrt[n]{a^m}$$

$$a^{\frac{m}{n}} = (\sqrt[n]{a})^m = \sqrt[n]{a^m}$$

$$\sqrt[3]{1} \times \sqrt[3]{125} \times \sqrt[3]{1000} = \sqrt[3]{1 \times 125 \times 1000} = \sqrt[3]{125000} = 50$$

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