Wyznacz $\sqrt{a}$ za pomocą metody Newtona

$$f(x) = x^2 - a = 0$$

$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)}$$

$$= x_n - \frac{x_n^2 - a}{2x_n} = \frac{1}{2}\left(x_n + \frac{a}{x_n}\right)$$

Wyznacz $\sqrt[m]{a}$

$$f(x) = x^m - a = 0$$

$$f'(x) = m\, x^{m-1}$$

$$x_{n+1} = x_n - \frac{f(x_n)}{f'(x_n)} = x_n - \frac{x_n^m - a}{m\, x_n^{m-1}}$$

$$= \left(1 - \frac{1}{m}\right)x_n + \frac{a}{m\, x_n^{m-1}}$$

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$$= \frac{(m-1)\, x_n^m + a}{m\, x_n^{m-1}}$$