

$$\left( \left( \left( \sqrt{2} \right)^4 \right)^8 \right)^{128} = \left[ \left( \left( 2^{\frac{1}{2}} \right)^{\frac{1}{4}} \right)^{\frac{1}{8}} \right]^{128}$$

$$\left[ \left( 2^{\frac{1}{2} \cdot \frac{1}{4}} \right)^{\frac{1}{8}} \right]^{128} = \left[ 2^{\frac{1}{8} \cdot \frac{1}{8}} \right]^{128} = \left( 2^{\frac{1}{64}} \right)^{128} = 2^{\frac{1}{64} \cdot 128} = 2^2 = 4$$

$$\sqrt[n]{2^m} = 2^{\frac{m}{n}}$$

$$\sqrt[n]{b} = b^{\frac{1}{n}}$$

$$\sqrt{c} = \sqrt[2]{c}$$

$$= c^{\frac{1}{2}}$$

$$(2^n)^m = 2^{n \cdot m}$$

$$= 2^2$$

$$\sqrt[3]{5 \cdot \sqrt{5 \cdot \sqrt{5}}}$$

$$\left( 5^1 \left( 5^1 5^{\frac{1}{2}} \right)^{\frac{1}{2}} \right)^{\frac{1}{3}}$$

$$\left( 5^1 \left( 5^{1 + \frac{1}{2}} \right)^{\frac{1}{2}} \right)^{\frac{1}{3}}$$

$$\left( 5^1 \cdot 5^{\frac{3}{4}} \right)^{\frac{1}{3}}$$

$$= \left( 5^{\frac{7}{4}} \right)^{\frac{1}{3}}$$

$$= 5^{\frac{7}{12}} = \sqrt[12]{5^7}$$

$$\sqrt[n]{2^m} = 2^{\frac{n}{m}}$$

$$2^n \cdot 2^m = 2^{n+m}$$

$$(2^n)^m = 2^{n \cdot m}$$

$$1 + \frac{1}{2} = \frac{2}{2} + \frac{1}{2} = \frac{3}{2}$$

$$1 + \frac{3}{4} = \frac{4}{4} + \frac{3}{4} = \frac{7}{4}$$

=

=

$\frac{1}{3}$

=

$\frac{1}{3}$

=

$\frac{7}{12}$

=

$\frac{7}{12}$

=

$\sqrt[12]{5^7}$