



Potenser

Heltalls-eksponenter

Definisjon:

$$a^n = \underbrace{a \cdot a \cdot a \cdot \dots \cdot a}_{n \text{ faktorer}}$$

$$a^0 = 1$$

$$a^{-n} = \frac{1}{a^n}$$

Regler:

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

$$\frac{a^n}{a^m} = a^{n-m}$$

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

$$(a \cdot b)^n = a^n \cdot b^n$$

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



Potenser / Kvadratrøtter

Rasjonale og irrasjonale eksponenter

Definisjon:

$$x = \sqrt[n]{a} \iff a = x^n \quad a > 0, \quad n \text{ naturlig tall}$$

$$a^{\frac{1}{n}} = \sqrt[n]{a} \quad a > 0, \quad n \text{ naturlig tall}$$

$$a^{\frac{m}{n}} = \left(\sqrt[n]{a}\right)^m \quad \text{eller} \quad a^{\frac{m}{n}} = \sqrt[n]{a^m} \quad a > 0, \quad n \text{ naturlig tall, } m \text{ helt tall}$$

$$a^x = \lim_{q \rightarrow x} a^q \quad x \text{ irrasjonalt tall } q \in \mathbb{Q}$$



Potenser / Kvadratrøtter

Eks – Eksponenter

$$2^3 \cdot 2^5 = 2^{3+5} = 2^8 = \underline{\underline{256}}$$

$$\frac{1}{3^{-3}} = 3^3 = \underline{\underline{27}}$$

$$\frac{10^3}{10^1} = 10^{3-1} = 10^2 = \underline{\underline{100}}$$

$$\frac{5^2}{5^2} = 5^{2-2} = 5^0 = \underline{\underline{1}}$$

$$10^{-2} = \frac{1}{10^2} = \frac{1}{100} = \underline{\underline{0.01}}$$

$$(2^3)^2 = 2^{3 \cdot 2} = 2^6 = \underline{\underline{64}}$$



Potenser / Kvadratrøtter

Rasjonale eksponenter

$$\sqrt{x} = \underline{\underline{x^{\frac{1}{2}}}}$$

$$\sqrt[3]{8^6} = 8^{\frac{6}{3}} = 8^2 = \underline{\underline{64}}$$

$$8^{\frac{1}{3}} = \sqrt[3]{8} = \underline{\underline{2}}$$

$$\sqrt[4]{4^2} = 4^{\frac{2}{4}} = 4^{\frac{1}{2}} = \sqrt{4} = \underline{\underline{2}}$$

$$\frac{\sqrt[3]{2^5}}{\sqrt[3]{2^2}} = \sqrt[3]{\frac{2^5}{2^2}} = \sqrt[3]{2^{5-2}} = \sqrt[3]{2^3} = 2^{\frac{3}{3}} = 2^1 = \underline{\underline{2}}$$



END