

Röknregler

$$a^b \cdot a^c = a^{b+c}$$

$$\frac{a^b}{a^c} = a^{b-c}$$

$$a^0 = 1$$

$$(a^b)^c = a^{b \cdot c}$$

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

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

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

$$0^b = 0$$

$$0^0 = \text{ej def.}$$

Anmärkning

$$3^{1/2} \cdot 3^{1/2} = 3^{\frac{1}{2} + \frac{1}{2}} = 3^1$$

$$\Downarrow \\ 3^{1/2} = \sqrt{3}$$

$$(3^{1/2})^2 = 3^{\frac{1}{2} \cdot 2} = 3^1$$

$$\Downarrow \\ 3^{1/2} = \sqrt{3}$$

Ex:

$$\sqrt[3]{x} \cdot \sqrt{x^{-1}} \cdot (x^2)^{2/3}$$

$$= (x^{1/3})^{1/2} \cdot (x^{-1})^{1/6} \cdot (x^2)^{2/3}$$

$$= x^{\frac{1}{3} \cdot \frac{1}{2}} \cdot x^{(-1) \cdot \frac{1}{6}} \cdot x^{2 \cdot \frac{2}{3}}$$

$$= x^{1/6} \cdot x^{-1/6} \cdot x^{4/3} = x^{\frac{1}{6} - \frac{1}{6} + \frac{4}{3}} = x^{4/3} = \sqrt[3]{x^4}$$

Ex:

$$(x^{1/3} + 2)(x^{1/3} - 2) = 12, \quad x \geq 0$$

Variabelbytt: $t = x^{1/3}$

$$(t + 2)(t - 2) = 12$$

$$t^2 - 4 = 12$$

$$t^2 = 16$$

$$t = 4 \text{ eller } t = -4$$

$$x^{1/3} = 4 \text{ el. } x^{1/3} = -4$$

$$(x^{1/3})^3 = 4^3$$

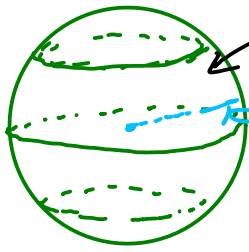
$$x = 64$$

$$(x^{1/3})^3 = (-4)^3$$

$$x = -64$$

by x måste vara ≥ 0

Ex:



Volumen: V

r proportional mit $\sqrt[3]{V}$

Radius: r

$$r = k \cdot \sqrt[3]{V}$$

Vi wet

$$18.2 = k \cdot \sqrt[3]{25.2}$$

$$k = \frac{18.2}{\sqrt[3]{25.2}} = 6.2078$$

$$r = 6.2078 \sqrt[3]{V}$$

Lösung: $r = 6.2078 \cdot \sqrt[3]{30} = 19.289$