Potenser och Potensekvationer

Ex) a) Lös ekvationen $x^3 = 20$

$(x^3)^{\frac{1}{3}} = 20^{\frac{1}{3}}$

$x = 20^{\frac{1}{3}} = 2{,}71$

Potensekvationer

$x^n = a$

$(x^n)^{\frac{1}{n}} = a^{\frac{1}{n}}$

fall 1: $x = \pm a^{\frac{1}{n}}$ om n är jämnt

fall 2 $x = a^{\frac{1}{n}}$ annars

b) $3x^6 = 18$

$x^6 = 6$

$(x^6)^{\frac{1}{6}} = 6^{\frac{1}{6}}$

$x = \pm 1{,}35$

Potenslagar: $a^x \cdot a^y = a^{x+y}$, $\frac{a^x}{a^y} = a^{x-y}$, $(a^x)^y = a^{xy}$

$a^{-x} = \frac{1}{a^x}$, $a^x \cdot b^x = (a \cdot b)^x$, $\frac{a^x}{b^x} = \left(\frac{a}{b}\right)^x$

$a^0 = 1$

c) $\frac{x^2 \cdot x^4}{x^3} = 50$

$\frac{x^{2+4}}{x^3} = \frac{x^6}{x^3} = x^{6-3} = x^3 = 50$

$(x^3)^{\frac{1}{3}} = (50)^{\frac{1}{3}}$

$x = 3{,}68$

d) $\sqrt{x} \cdot x = 25$

$x^{\frac{1}{2}} \cdot x = 25$

$x^{\frac{1}{2}+1} = 25$

$x^{\frac{3}{2}} = 25$

$\left(x^{\frac{3}{2}}\right)^{\frac{2}{3}} = 25^{\frac{2}{3}}$

$x = 8{,}55$