

Equationen $x^n = a$

Vi løser $x^2 = 9$

$$x = \pm 3$$

men $x^5 = 9$?

$$x^5 = 9$$

$$(x^5)^{\frac{1}{5}} = 9^{\frac{1}{5}}$$

$$x^{5 \cdot \frac{1}{5}} = 9^{\frac{1}{5}}$$

$$x^1 = 9^{\frac{1}{5}}$$

$$x = 9^{\frac{1}{5}} \approx 1,55$$

$x^n = a$ løser man på følgende sätt

om n er jämnt får vi två svar

(+)
(-)

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

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

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

Ex) Lös equationerna

a) $2x^7 = 36$

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$$x^7 = 18$$

$$(x^7)^{\frac{1}{7}} = 18^{\frac{1}{7}} \approx 1,51 \quad x \approx 1,51$$

b) $x^8 - 15 = 10$

b) $x^8 - 15 = 10$

$$x^8 = 25$$

$$(x^8)^{\frac{1}{8}} = 25^{\frac{1}{8}} \approx \pm 1,5$$

c) $x^{\frac{4}{3}} = 32$

d) $3x^{\frac{7}{2}} - 8 = 22$

$$x = \pm 1,5$$

e) $(\sqrt{x} \cdot \sqrt{x} \cdot \sqrt{x})^{\frac{1}{3}} = 10$

$$c) x^{\frac{4}{3}} = 32$$

$$\left(x^{\frac{4}{3}}\right)^{\frac{3}{4}} = 32^{\frac{3}{4}}$$

$$x^{\frac{4 \cdot 3}{3 \cdot 4}} = 32^{\frac{3}{4}}$$

$$x \approx 13,45$$

$$d) 3x^{\frac{7}{2}} - 8 = 22$$

$$3x^{\frac{7}{2}} = 30$$

$$x^{\frac{7}{2}} = 10$$

$$\left(x^{\frac{7}{2}}\right)^{\frac{2}{7}} = 10^{\frac{2}{7}}$$

$$x \approx 1,93$$

$$e) (\sqrt{x} \cdot \sqrt{x} \cdot \sqrt{x})^{\frac{1}{3}} = 10$$

$$\left(x^{\frac{1}{2}} \cdot x^{\frac{1}{2}} \cdot x^{\frac{1}{2}}\right)^{\frac{1}{3}} = 10$$

$$\left(x^{\frac{3}{2}}\right)^{\frac{1}{3}} = 10$$

$$x^{\frac{3}{2} \cdot \frac{1}{3}} = 10$$

$$x^{\frac{1}{2}} = 10$$

$$\left(x^{\frac{1}{2}}\right)^{\frac{2}{1}} = 10^{\frac{2}{1}}$$

$$x = 100$$