9. Kuutiojuuri

Esim. a) $x^3 = 8 \Leftrightarrow x = 2 = \sqrt[3]{8}$

b) $x^3 = -27 \Leftrightarrow x = -3 = \sqrt[3]{-27}$

Yleisesti $x^3 = a \Leftrightarrow x = \sqrt[3]{a}$

"3. juuri luvusta a"

"kuutiojuuri a:sta"

$1^\circ\ a \geq 0 \Rightarrow \sqrt[3]{a} \geq 0$

$2^\circ\ a \leq 0 \Rightarrow \sqrt[3]{a} \leq 0$

9.1 a) $\sqrt[3]{125} = 5$ $(5^3 = 125)$

b) $\sqrt[3]{0} = 0$ $(0^3 = 0)$

c) $\sqrt[3]{-1000} = -10$ $((-10)^3 = -1000)$

d) $\sqrt[3]{4}$ ei sievene

9.2 a) $\sqrt[3]{-39} \approx -3,391$

b) $\sqrt[3]{0,27} \approx 0,646$

c) $\sqrt[3]{-546} \approx -8,173$

d) $\sqrt{4711} \approx 68,637$

9.3 a) $\sqrt[3]{3-30} = \sqrt[3]{-27} = -3$ $((-3)^3 = -27)$

b) $(\sqrt[3]{-7})^3 = -7$ $((\sqrt[3]{a})^3 = a)$

9.4 a) $x^3 = 729 \quad |\sqrt[3]{} \Leftrightarrow x = \sqrt[3]{729} = 9$

b) $4x^3 + 108 = 0 \Leftrightarrow 4x^3 = -108 \quad |:4 \Leftrightarrow x^3 = -27 \quad |\sqrt[3]{} \Leftrightarrow x = \sqrt[3]{-27} = -3$

8.20 a) $7x^2 = 42 \quad |:7 \Leftrightarrow x^2 = 6 \quad |\sqrt{} \Leftrightarrow x = \pm\sqrt{6}$

b) $100x^2 - 16 = 0 \Leftrightarrow 100x^2 = 16 \quad |:100 \Leftrightarrow x^2 = \frac{16}{100} \quad |\sqrt{}$

$\Leftrightarrow x = \pm\sqrt{\frac{16}{100}} = \pm\frac{4}{10} = \pm\frac{2}{5}$

c) $7 - 9x^2 = 8 \Leftrightarrow -1 = 9x^2 \quad |:9 \Leftrightarrow \underbrace{x^2}_{\geq 0} = -\frac{1}{9}$ ↯ ei ratk.

d) $2x(x+2) = 4x + 4$

$\Leftrightarrow 2x^2 + 4x = 4x + 4 \quad |-4x$

$\Leftrightarrow 2x^2 = 4 \quad |:2 \Leftrightarrow x^2 = 2 \quad |\sqrt{} \Leftrightarrow x = \pm\sqrt{2}$

9.6 meanantai : 256 $\cdot x$

tiistai : $x \cdot 256$ $\cdot x$

keskiviikko : $x^2 \cdot 256$ $\cdot x$

torstai : $x^3 \cdot 256 = 814 \quad |:256$