Ratkaisuja harjoitustehtäviin:

Neliöjuuri

1 $a)\ \sqrt{25} = 5$, koska $5^2 = 25$ $b)\ \sqrt{1} = 1$, koska $1^2 = 1$ $c)\ \sqrt{36} = 6$, koska $6^2 = 36$ $d)\ \sqrt{4} = 2$, koska $2^2 = 4$.

2) $a)\ \sqrt{81} - \sqrt{9} = 9 - 3 = 6$ $b)\ \sqrt{25 - 16} = \sqrt{9} = 3$ $c)\ \sqrt{25} - \sqrt{16} = 5 - 4 = 1$.

3) $a)\ \left(\sqrt{6}\right)^2 = 6$ $b)\ \left(-\sqrt{6}\right)^2 = 6$ $c)\ \left(\sqrt{5 - \sqrt{1}}\right)^2 = \left(\sqrt{4}\right)^2 = 4$

Neliöjuuren laskusäännöt

1. a) $\sqrt{4 \cdot 16} = \sqrt{4}\sqrt{16} = 2 \cdot 4 = 8$ b) $\sqrt{2} \cdot \sqrt{32} = \sqrt{2 \cdot 32} = \sqrt{64} = 8$ c)$\sqrt{3}\sqrt{12} = \sqrt{3 \cdot 12} = \sqrt{36} = 6$

2. a) $\frac{\sqrt{8}}{\sqrt{50}} = \sqrt{\frac{8^{(2}}{50}} = \sqrt{\frac{4}{25}} = \frac{\sqrt{4}}{\sqrt{25}} = \frac{2}{5}$ b) $\sqrt{\frac{16}{25}} = \frac{\sqrt{16}}{\sqrt{25}} = \frac{4}{5}$ c) $\frac{\sqrt{3}\sqrt{5}}{\sqrt{30}} = \frac{\sqrt{3 \cdot 5}}{\sqrt{30}} = \frac{\sqrt{15}}{\sqrt{30}} = \sqrt{\frac{15^{(15}}{30}} = \sqrt{\frac{1}{2}} = \frac{1}{\sqrt{2}}$.

3. a) $\sqrt{12} + 2\sqrt{3} - 3\sqrt{2} + \sqrt{8} = \sqrt{4 \cdot 3} + 2\sqrt{3} - 3\sqrt{2} + \sqrt{4 \cdot 2} = \sqrt{4}\sqrt{3} + 2\sqrt{3} - 3\sqrt{2} + \sqrt{4}\sqrt{2} = 2\sqrt{3} + 2\sqrt{3} - 3\sqrt{2} + 2\sqrt{2} = 4\sqrt{3} - \sqrt{2}$ b) $\sqrt{50} - \sqrt{5}\sqrt{10} = \sqrt{50} - \sqrt{5 \cdot 10} = \sqrt{50} - \sqrt{50} = 0$.

Korkeammat juuret

1. a) $3x^5 + 96 = 0$

$$3x^5 = -96$$

$$x^5 = \frac{-96}{3}$$

$$x^5 = -32$$

$$x = -2$$

b) $2x^4 - 32 = 0$

$$2x^4 = 32$$

$$x^4 = 16$$

$$x = 2$$

2. a) $5x^6 = 70$

$$x^6 = 14$$

$$x = \pm\sqrt[6]{14}$$

b) $4x^5 - 128 = 0$

$$4x^5 = 128$$

$$x^5 = \frac{128}{4}$$

$$x^5 = 32$$

$$x = 2$$