

RIBPWI

Op vele verzoek bijgaand de uitwerkingen van opgave 4.

Uitwerking Wortels – 23/10/2010

Opgave 1.

$$7\sqrt{48} - \sqrt{27} + 3\sqrt{75} =$$

$$7\sqrt{3*16} - \sqrt{3^3} + 2\sqrt{3*5^2} =$$

$$28\sqrt{3} - 3\sqrt{3} + 10\sqrt{3} = 35\sqrt{3}$$

Opgave 2.

$$\frac{\sqrt{54a^3}}{a} - 2\sqrt{24a} =$$

$$\frac{\sqrt{2*3^3*a^3}}{a} - 2\sqrt{4*6*a} =$$

$$\frac{3a\sqrt{6a}}{a} - 4\sqrt{6a} =$$

$$3\sqrt{6a} - 4\sqrt{6a} =$$

$$-\sqrt{6a}$$

Opgave 3.

$$\sqrt[3]{a} + \sqrt[3]{27a} =$$

$$\sqrt[3]{a} + \sqrt[3]{3^3 a} =$$

$$1*\sqrt[3]{a} + 3*\sqrt[3]{a} = 4\sqrt[3]{a}$$

Opgave 4.

$$a\sqrt{\frac{27a^3}{b}} - a\sqrt{\frac{75b^5}{a^3}} + b\sqrt{\frac{12b^3}{a}} - b\sqrt{\frac{3a^5}{b^3}} =$$

$$a\sqrt{\frac{3 \cdot 9 \cdot a \cdot a^2}{b}} - a\sqrt{\frac{3 \cdot 25 \cdot b^4 \cdot b^1}{a^3}} + b\sqrt{\frac{4 \cdot 3 \cdot b^2 \cdot b^1}{a}} - b\sqrt{\frac{3 \cdot a^4 \cdot a^1}{b^3}} =$$

$$3a^2\sqrt{\frac{3a}{b}} - \frac{5ab^2}{a^1}\sqrt{\frac{3b}{a^1}} + 2b^2\sqrt{\frac{3b}{a}} - \frac{a^2b}{b^1}\sqrt{\frac{3a}{b^1}} =$$

$$3a^2\sqrt{\frac{3a}{b}} - 5b^2\sqrt{\frac{3b}{a}} + 2b^2\sqrt{\frac{3b}{a}} - a^2\sqrt{\frac{3a}{b}} =$$

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$$3a^2\sqrt{\frac{3a^2}{ab}} - 5b^2\sqrt{\frac{3b^2}{ab}} + 2b^2\sqrt{\frac{3b^2}{ab}} - a^2\sqrt{\frac{3a^2}{ab}} =$$

$$2a^2\sqrt{\frac{3a^2}{ab}} - 3b^2\sqrt{\frac{3b^2}{ab}} =$$

$$2a^3\sqrt{\frac{3}{ab}} - 3b^3\sqrt{\frac{3}{ab}} =$$

$$(2a^3 - 3b^3)\sqrt{\frac{3}{ab}}$$

Opgave 5.

$$\sqrt{a} * \sqrt[3]{a} =$$

$$a^{\frac{1}{2}} * a^{\frac{1}{3}} =$$

$$a^{\frac{3}{6}} * a^{\frac{2}{6}} =$$

$$a^{\frac{5}{6}} = a^{\sqrt[6]{5}}$$

Opgave 6.

$$\frac{\sqrt[5]{a^3}}{a^3\sqrt{a^2}} = \frac{a^{\frac{3}{5}}}{a^{\frac{3}{3}} * a^{\frac{2}{3}}} = a^{\frac{3}{5}} * a^{\frac{-5}{3}} = a^{\frac{9}{15}} * a^{\frac{-25}{15}} = a^{\frac{-16}{15}} = \sqrt[15]{\frac{1}{a^{16}}} = \frac{1}{\sqrt[15]{a^{16}}} = \frac{1}{a^{\sqrt[15]{a}}}$$

Opgave 7

$$\frac{\sqrt[3]{9a^4}}{\sqrt{3a^3}} = \frac{3^{\frac{2}{3}} * a^{\frac{4}{3}}}{3^{\frac{1}{2}} * a^{\frac{3}{2}}} = 3^{\frac{4}{6} * a^{\frac{8}{6}} * 3^{\frac{-3}{6}} * a^{\frac{-9}{6}}} = 3^{\frac{1}{6}} * a^{\frac{-1}{6}} = \sqrt[6]{3 * a^{-1}} = \sqrt[6]{\frac{3}{a}}$$

Opgave 8

$$\frac{\sqrt[3]{a} * a\sqrt{30}}{\sqrt{5a} * \sqrt[3]{60a^2}} = \frac{a^{\frac{1}{3}} * a * 2^{\frac{1}{2}} * 3^{\frac{1}{2}} * 5^{\frac{1}{2}}}{5^{\frac{1}{2}} * a^{\frac{1}{2}} * 2^{\frac{2}{3}} * 3^{\frac{1}{3}} * 5^{\frac{1}{3}} * a^{\frac{2}{3}}} =$$

$$\frac{a^{\frac{1}{3}} * a^1 * a^{-\frac{1}{2}} * a^{-\frac{2}{3}} * 2^{\frac{1}{2}} * 3^{\frac{1}{2}}}{2^{\frac{2}{3}} * 3^{\frac{1}{3}} * 5^{\frac{1}{3}}} = \frac{a^{\frac{1}{6}} * 3^{\frac{1}{6}}}{2^{\frac{1}{6}} * 5^{\frac{1}{6}}} = \frac{\sqrt[6]{3a}}{\sqrt[6]{2 * 5}} =$$

$$\frac{\sqrt[6]{3a}}{\sqrt[6]{2} * \sqrt[6]{25}} = \sqrt[6]{\frac{3a}{50}}$$

Opgave 9

$$9^{1.5} = 9^{\frac{3}{2}} = \sqrt{9^3} = 27$$

Opgave 10

$$32^{\frac{2}{5}} = \sqrt[5]{32^2} = \sqrt[5]{1024} = \sqrt[5]{4^5} = 4$$

Opgave 11

$$\left(\frac{81}{16}\right)^{\frac{3}{4}} = \left(\frac{3^4}{2^4}\right)^{\frac{3}{4}} = \left(\frac{3^3}{2^3}\right) = \frac{27}{8}$$

Opgave 12

$$\left(\frac{27}{8}\right)^{\frac{-2}{3}} = \left(\frac{3^3}{2^3}\right)^{\frac{-2}{3}} = \frac{3^{-2}}{2^{-2}} = \frac{4}{9}$$

Opgave 13

$$\frac{\frac{1}{\sqrt{2}} + \sqrt{2}}{3} = \frac{\frac{1}{\sqrt{2}} + \frac{2}{\sqrt{2}}}{3} = \frac{\frac{3}{\sqrt{2}}}{3} = \frac{1}{\sqrt{2}}$$

Opgave 14

$$\sqrt[3]{x+2} - \frac{2}{\sqrt[3]{(x+2)^2}} = \frac{(x+2)^{\frac{1}{3}} * (x+2)^{\frac{2}{3}} - 2}{\sqrt[3]{(x+2)^2}} = \frac{x+2-2}{\sqrt[3]{(x+2)^2}} = \frac{x}{\sqrt[3]{(x+2)^2}}$$

Opgave 15

$$\sqrt[4]{16a^5} - \frac{a^2}{\sqrt[4]{81a^3}} = \frac{2^{\frac{4}{4}} * a^{\frac{5}{4}} * 3^{\frac{4}{4}} * a^{\frac{3}{4}} - a^2}{3^{\frac{4}{4}} * a^{\frac{3}{4}}} = \frac{5a^2}{3a^{\frac{3}{4}}} = \frac{5a^2 * a^{\frac{-3}{4}}}{3} = \frac{5 * a^{\frac{8}{4}} * a^{\frac{-3}{4}}}{4} = \frac{5a^{\frac{5}{4}}}{3} = \frac{5a^4 \sqrt{a}}{3}$$