

Klasa VII – matematyka

<https://pistacja.tv/wideolekcje/matematyka/szkola-podstawowa-vii-viii/pierwiastki/plmat062-dzialania-na-pierwiastkach> - zobacz filmiki dotyczące tej lekcji.

Notatka do zeszytu.

Podręcznik, str.252 – 255.

Temat: Działania na pierwiastkach. (12.05.2020r.)

1. Pierwiastek z iloczynu jest równy iloczynowi pierwiastków.

a) Dla $a \geq 0$ i $b \geq 0$:

$$\sqrt{a * b} = \sqrt{a} * \sqrt{b}$$

b) Dla dowolnych liczb a i b :

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

2. Pierwiastek z ilorazu jest równy ilorazowi pierwiastków.

a) Dla $a \geq 0$ i $b > 0$:

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

b) Dla dowolnej liczby a i $b \neq 0$:

$$\sqrt[3]{\frac{a}{b}} = \frac{\sqrt[3]{a}}{\sqrt[3]{b}}$$

Przykłady, str.252. (przypatrz się dokładnie jak są obliczone te przykłady)

Ćwiczenie B, str.252.

a) $\sqrt{8100} = \sqrt{81 * 100} = \sqrt{81} * \sqrt{100} = 9 * 10 = 90$

b) $\sqrt[3]{0,125} = \sqrt[3]{\frac{125}{1000}} = \frac{\sqrt[3]{125}}{\sqrt[3]{1000}} = \frac{5}{10} = 0,5$

c) $\sqrt{16 * 25} = \sqrt{16} * \sqrt{25} = 4 * 5 = 20$

d) $\sqrt[3]{27 * 0,008} = \sqrt[3]{27} * \sqrt[3]{0,008} = 3 * \sqrt[3]{\frac{8}{1000}} = 3 * \frac{2}{10} = \frac{6}{10} = 0,6$

e) $\sqrt{0,36 * 6400} = \sqrt{0,36} * \sqrt{6400} = \sqrt{\frac{36}{100}} * \sqrt{64 * 100} = \frac{6}{10} * \sqrt{64} * \sqrt{100} =$
 $= \frac{6}{10} * 8 * 10 = 48$

f) $\sqrt[3]{27 * 8000} = \sqrt[3]{27} * \sqrt[3]{8000} = 3 * \sqrt[3]{8} * \sqrt[3]{1000} = 3 * 2 * 10 = 60$

Zad.1, str.253.

a) $\sqrt{2 * 2 * 5 * 5} = \sqrt{2 * 2} * \sqrt{5 * 5} = 2 * 5 = 10$

b) $\sqrt[3]{6 * 6 * 3 * 3 * 6 * 3} = \sqrt[3]{6 * 6 * 6} * \sqrt[3]{3 * 3 * 3} = 6 * 3 = 18$

c) $\sqrt{5^2 * 4^2} = \sqrt{5^2} * \sqrt{4^2} = 5 * 4 = 20$

d) $\sqrt[3]{2^3 * 7^3} = \sqrt[3]{2^3} * \sqrt[3]{7^3} = 2 * 7 = 14$

Zad.3, str.253.

a) $\sqrt{7^4 * 4^2} = \sqrt{(7^2)^2} * \sqrt{4^2} = 7^2 * 4 = 49 * 4 = 196$

b) $\sqrt[3]{3^6 * 10^3} = \sqrt[3]{(3^2)^3} * \sqrt[3]{10^3} = 3^2 * 10 = 9 * 10 = 90$

c) $\sqrt{5^4 * 2^6 * 7^2} = \sqrt{(5^2)^2} * \sqrt{(2^3)^2} * \sqrt{7^2} = 5^2 * 2^3 * 7 = 25 * 8 * 7 = 1400$

d) $\sqrt[3]{3^3 * 10^6 * 2^9} = \sqrt[3]{3^3} * \sqrt[3]{(10^2)^3} * \sqrt[3]{(2^3)^3} = 3 * 10^2 * 2^3 = 3 * 100 * 8 = 2400$

Zad.5, str.253.

a) $7\sqrt{2} * 3\sqrt{3} = 21\sqrt{6}$

b) $\frac{3\sqrt{5} * \sqrt{6}}{2\sqrt{2}} = \frac{3\sqrt{30}}{2\sqrt{2}} = \frac{3\sqrt{15}}{2}$

c) $3\sqrt[3]{3} * 4\sqrt[3]{7} = 12\sqrt[3]{21}$

d) $\sqrt[3]{\frac{1}{3}} * 2\sqrt[3]{6} = 2\sqrt[3]{2}$

e) $\frac{4\sqrt[3]{-6}}{2\sqrt[3]{-2}} = 2\sqrt[3]{2}$

Temat: Działania na pierwiastkach. (13.05.2020r.)

Zad.6, str.254.

a) $\sqrt{12} = \sqrt{4 * 3} = 2\sqrt{3}$

$$\sqrt{175} = \sqrt{7 * 25} = 5\sqrt{7}$$

$$\sqrt[3]{32} = \sqrt[3]{8 * 4} = 2\sqrt[3]{4}$$

$$\sqrt[3]{-80} = \sqrt[3]{-8 * 10} = -2\sqrt[3]{10}$$

b) $\sqrt{20} = \sqrt{4 * 5} = 2\sqrt{5}$

$$\sqrt{300} = \sqrt{100 * 3} = 10\sqrt{3}$$

$$\sqrt[3]{54} = \sqrt[3]{27 * 2} = 3\sqrt[3]{2}$$

$$\sqrt[3]{-10000} = -\sqrt[3]{1000 * 10} = -10\sqrt[3]{10}$$

c) $\sqrt{18} = \sqrt{9 * 2} = 3\sqrt{2}$

$$\sqrt{28} = \sqrt{4 * 7} = 2\sqrt{7}$$

$$\sqrt[3]{250} = \sqrt[3]{125 * 2} = 5\sqrt[3]{2}$$

$$\sqrt[3]{-56} = -\sqrt[3]{8 * 7} = -2\sqrt[3]{7}$$

Zad.7, str.254.

a) $\sqrt{50} = \sqrt{25 * 2} = 5\sqrt{2}$

$$\sqrt{28} = \sqrt{4 * 7} = 2\sqrt{7}$$

$$\sqrt{72} = \sqrt{36 * 2} = 6\sqrt{2}$$

$$\sqrt{200} = \sqrt{100 * 2} = 10\sqrt{2}$$

$$\sqrt{1800} = \sqrt{900 * 2} = 30\sqrt{2}$$

$$b) \sqrt[3]{16} = \sqrt[3]{8 * 2} = 2\sqrt[3]{2}$$

$$\sqrt[3]{24} = \sqrt[3]{8 * 3} = 2\sqrt[3]{3}$$

$$\sqrt[3]{-128} = -\sqrt[3]{64 * 2} = -4\sqrt[3]{2}$$

$$\sqrt[3]{3000} = \sqrt[3]{1000 * 3} = 10\sqrt[3]{3}$$

Zad.9, str.254.

$$a) \sqrt{12} + 5\sqrt{3} = \sqrt{4 * 3} + 5\sqrt{3} = 2\sqrt{3} + 5\sqrt{3} = 7\sqrt{3}$$

$$b) 2\sqrt{48} + 2\sqrt{3} = 2\sqrt{16 * 3} + 2\sqrt{3} = 2 * 4\sqrt{3} + 2\sqrt{3} = 10\sqrt{3}$$

$$c) 3\sqrt{20} + \sqrt{5} = 3\sqrt{4 * 5} + \sqrt{5} = 3 * 2\sqrt{5} + \sqrt{5} = 7\sqrt{5}$$

$$d) \sqrt{18} - 2\sqrt{8} = \sqrt{9 * 2} - 2\sqrt{4 * 2} = 3\sqrt{2} - 2 * 2\sqrt{2} = 3\sqrt{2} - 4\sqrt{2} = -\sqrt{2}$$

$$e) \sqrt{90} + \sqrt{40} + \sqrt{250} = \sqrt{9 * 10} + \sqrt{4 * 10} + \sqrt{25 * 10} = 3\sqrt{10} + 2\sqrt{10} + 5\sqrt{10} = 10\sqrt{10}$$

$$f) \sqrt[3]{40} + \sqrt[3]{135} = \sqrt[3]{8 * 5} + \sqrt[3]{27 * 5} = 2\sqrt[3]{5} + 3\sqrt[3]{5} = 5\sqrt[3]{5}$$

Zad.13, str.255.

$$a) 5\sqrt{3} = \sqrt{25 * 3} = \sqrt{75}$$

$$b) 7\sqrt{2} = \sqrt{49 * 2} = \sqrt{98}$$

$$c) 6\sqrt{\frac{5}{6}} = \sqrt{36 * \frac{5}{6}} = \sqrt{30}$$

$$d) \frac{1}{2}\sqrt{12} = \sqrt{\frac{1}{4} * 12} = \sqrt{3}$$

e) ...

$$f) 4\sqrt[3]{\frac{3}{32}} = \sqrt[3]{64 * \frac{3}{32}} = \sqrt[3]{6}$$