

ESERCIZI ASSEGNATI PER LE VACANZE NATALIZIE

PRIMA PROPRIETÀ FONDAMENTALE IN \mathbb{R}_0^+

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7. $(\sqrt{3})^2 = (3^{\frac{1}{2}})^2 = 3^{\frac{1}{2} \cdot 2} = 3$ $(\sqrt{2})^2 = (2^{\frac{1}{2}})^2 = 2^{\frac{1}{2} \cdot 2} = 2$
 $\sqrt{7} \cdot \sqrt{7} = 7^{\frac{1}{2}} \cdot 7^{\frac{1}{2}} = 7^{\frac{1}{2} + \frac{1}{2}} = 7$ $2\sqrt{3} \cdot \sqrt{3} = 2 \cdot 3^{\frac{1}{2}} \cdot 3^{\frac{1}{2}} = 2 \cdot 3^{\frac{1}{2} + \frac{1}{2}} = 2 \cdot 3 = 6$
8. $(\sqrt{\pi + 2})^2 = [(\pi + 2)^{\frac{1}{2}}]^2 = (\pi + 2)^{\frac{1}{2} \cdot 2} = \pi + 2$
 $(\sqrt{\sqrt{5} + \sqrt{6}})^2 = [(\sqrt{5} + \sqrt{6})^{\frac{1}{2}}]^2 = (\sqrt{5} + \sqrt{6})^{\frac{1}{2} \cdot 2} = \sqrt{5} + \sqrt{6}$
 $(\sqrt{a + 2b})^2 = [(a + 2b)^{\frac{1}{2}}]^2 = (a + 2b)^{\frac{1}{2} \cdot 2} = a + 2b$
 $(\sqrt{a - b})^2 = [(a - b)^{\frac{1}{2}}]^2 = (a - b)^{\frac{1}{2} \cdot 2} = a - b$
9. $(\sqrt{3 + \sqrt{2}})^2 + (\sqrt{4 - \sqrt{2}})^2 = 3 + \sqrt{2} + 4 - \sqrt{2} = 7$
 $(\sqrt{5 + \sqrt{3}})^2 - (\sqrt{6 + \sqrt{3}})^2 = 5 + \sqrt{3} - (6 + \sqrt{3}) = 5 + \sqrt{3} - 6 - \sqrt{3} = -1$

SECONDA PROPRIETÀ FONDAMENTALE IN \mathbb{R}_0^+

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21. $\sqrt{3,2^2} = (3,2^2)^{\frac{1}{2}} = 3,2^{2 \cdot \frac{1}{2}} = 3,2$ $\sqrt[3]{7^3} = (7^3)^{\frac{1}{3}} = 7^{3 \cdot \frac{1}{3}} = 7$
 $\sqrt[4]{(1 + \sqrt{2})^4} = [(1 + \sqrt{2})^4]^{\frac{1}{4}} = (1 + \sqrt{2})^{4 \cdot \frac{1}{4}} = 1 + \sqrt{2}$
 $\sqrt{y^2} = (y^2)^{\frac{1}{2}} = y^{2 \cdot \frac{1}{2}} = y$ $\sqrt{(a - b)^2} = [(a - b)^2]^{\frac{1}{2}} = (a - b)^{2 \cdot \frac{1}{2}} = a - b$
 $\sqrt[7]{(\sqrt{3} - 1)^7} = [(\sqrt{3} - 1)^7]^{\frac{1}{7}} = (\sqrt{3} - 1)^{7 \cdot \frac{1}{7}} = \sqrt{3} - 1$
 $\sqrt[n]{3^n \cdot 4^n} = 3^{\frac{n}{n}} \cdot 4^{\frac{n}{n}} = 3 \cdot 4 = 12$
22. $\sqrt[3]{a^3 b^3} = a^{\frac{3}{3}} b^{\frac{3}{3}} = ab$ $\sqrt[7]{2^7 a^7} = 2^{\frac{7}{7}} a^{\frac{7}{7}} = 2a$
 $\sqrt[n]{\frac{a^n}{2^n b^n}} = \frac{a^{\frac{n}{n}}}{2^{\frac{n}{n}} b^{\frac{n}{n}}} = \frac{a}{2b}$ $\sqrt[4]{x^{12}} = x^{\frac{12}{4}} = x^3$ $\sqrt[6]{a^{18}} = a^{\frac{18}{6}} = a^3$
23. $\sqrt[5]{(a - b)^{10}} = (a - b)^{\frac{10}{5}} = (a - b)^2$ $\sqrt[7]{x^{21} y^7} = x^{\frac{21}{7}} y^{\frac{7}{7}} = x^3 y$
 $\sqrt[3]{5^6} = 5^{\frac{6}{3}} = 5^2 = 25$ $\sqrt[4]{3^{12}} = 3^{\frac{12}{4}} = 3^3 = 27$
 $\sqrt[10]{2^{20}} = 2^{\frac{20}{10}} = 2^2 = 4$ $\sqrt[5]{10^{10}} = 10^{\frac{10}{5}} = 10^2 = 100$

PROPRIETÀ INVARIANTIVA IN \mathbb{R}_0^+

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$$31. \quad \sqrt[3]{2} = \sqrt[6]{2^3} \qquad \sqrt[3]{5} = \sqrt[15]{5^5} \qquad \sqrt[3]{2} = \sqrt[6]{2^2} = \sqrt[18]{2^6}$$

$$32. \quad -\sqrt[4]{3} = -\sqrt[16]{3^4} \qquad -\sqrt[3]{a} = -\sqrt[6]{a^2} \qquad \sqrt[8]{a-b} = \sqrt[16]{(a-b)^2}$$

$$33. \quad \sqrt[3]{2a} = \sqrt[6]{2^2 a^2} \qquad \sqrt[3]{ab^2} = \sqrt[15]{a^5 b^{10}}$$

$$\sqrt[4]{a(x-y)} = \sqrt[12]{a^3(x-y)^3} \qquad \sqrt[3]{2a^2b} = \sqrt[9]{2^3 a^6 b^3}$$

$$34. \quad \sqrt{\frac{a-b}{2a}} = \sqrt[12]{\frac{(a-b)^6}{2^6 a^6}} \qquad \sqrt[3]{(a-3b)^2} = \sqrt[3]{(a-3b)^2}$$

$$\sqrt[7]{2a^2b^5} = \sqrt[21]{2^3 a^6 b^{15}} \qquad \sqrt[4]{2a^2b^2c} = \sqrt[12]{2^3 a^6 b^6 c^3}$$

$$35. \quad \sqrt{x} = \sqrt[2n]{x^n} \qquad \sqrt[5]{ab^2} = \sqrt[5n]{a^n b^{2n}} \qquad \sqrt[n]{a} = \sqrt[2n]{a^2} \qquad \sqrt[3n]{2a^2b^n} = \sqrt[6n^2]{2^{2n} a^{4n} b^{2n^2}}$$

$$36. \quad \sqrt[n]{a-b} = \sqrt[n^2]{(a-b)^n} \qquad \sqrt[n]{a^3} = \sqrt[3n]{a^9} \qquad \sqrt[n]{a^2} = \sqrt[2n^2]{a^{4n}} \qquad \sqrt[2n]{a+b} = \sqrt[6nm]{(a+b)^{3m}}$$

$$37. \quad \sqrt[3]{a} = \sqrt[6n]{a^{2n}} \qquad \sqrt[n]{a^3b^2} = \sqrt[3n^2]{a^{9n}b^{6n}}$$

$$\sqrt[2n]{x-y} = \sqrt[6n^3]{(x-y)^{3n^2}} \qquad \sqrt[a+1]{xy^2} = \sqrt[a^2-1]{(xy^2)^{a-1}}$$

$$38. \quad \sqrt[4a]{2 + \frac{1}{3}} = \sqrt[4a^2]{\left(\frac{7}{3}\right)^a} \qquad \sqrt[n]{2x^n(x+y)^3} = \sqrt[n^2m]{2^{nm}x^{n^2m}(x+y)^{3nm}}$$

$$\sqrt{\frac{3x^n}{2x-y}} = \sqrt[4n^2]{\frac{3^{2n^2}x^{2n^3}}{(2x-y)^{2n^2}}}$$