

PROPRIETÀ IN \mathbb{R}_0^+

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

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

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

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

PROPRIETÀ INVARIANTIVA IN \mathbb{R}_0^+

19. $\sqrt{2} = \sqrt[6]{2^3}$ $\sqrt[3]{5} = \sqrt[15]{5^5}$ $\sqrt[3]{2} = \sqrt[6]{2^2} = \sqrt[18]{2^6}$
20. $-\sqrt[4]{3} = -\sqrt[16]{3^4}$ $-\sqrt[3]{a} = -\sqrt[6]{a^2}$ $\sqrt[8]{a-b} = \sqrt[16]{(a-b)^2}$

21. $\sqrt[3]{2a} = \sqrt[6]{2^2 a^2}$ $\sqrt[3]{ab^2} = \sqrt[15]{a^5 b^{10}}$
22. $\sqrt[4]{a(x-y)} = \sqrt[12]{a^3(x-y)^3}$ $\sqrt[3]{2a^2b} = \sqrt[9]{2^3 a^6 b^3}$
23. $\sqrt{\frac{a-b}{2a}} = \sqrt[12]{\frac{(a-b)^6}{2^6 a^6}}$ $\sqrt[3]{(a-3b)^2} = \sqrt[3]{(a-3b)^2}$
24. $\sqrt[7]{2a^2b^5} = \sqrt[21]{2^3 a^6 b^{15}}$ $\sqrt[4]{2a^2b^2c} = \sqrt[12]{2^3 a^6 b^6 c^3}$
25. $\sqrt{x} = \sqrt[2n]{x^n}$ $\sqrt[5]{ab^2} = \sqrt[5n]{a^n b^{2n}}$ $\sqrt[n]{a} = \sqrt[2n]{a^2}$ $\sqrt[3n]{2a^2b^n} = \sqrt[6n^2]{2^{2n} a^{4n} b^{2n^2}}$
26. $\sqrt[n]{a-b} = \sqrt[n^2]{(a-b)^n}$ $\sqrt[n]{a^3} = \sqrt[3n]{a^9}$ $\sqrt[n]{a^2} = \sqrt[2n^2]{a^{4n}}$ $\sqrt[2n]{a+b} = \sqrt[6nm]{(a+b)^{3m}}$
27. $\sqrt[3]{a} = \sqrt[6n]{a^{2n}}$ $\sqrt[n]{a^3b^2} = \sqrt[3n^2]{a^{9n} b^{6n}}$
28. $\sqrt[2n]{x-y} = \sqrt[6n^3]{(x-y)^{3n^2}}$ $a^{+1}\sqrt{xy^2} = a^2 \sqrt[2]{(xy^2)^{a-1}}$
29. $\sqrt[4a]{2 + \frac{1}{3}} = \sqrt[4a^2]{\left(\frac{7}{3}\right)^a}$ $\sqrt[n]{2x^n(x+y)^3} = \sqrt[n^2 m]{2^{nm} x^{n^2 m} (x+y)^{3nm}}$
30. $\sqrt{\frac{3x^n}{2x-y}} = \sqrt[4n^2]{\frac{3^{2n^2} x^{2n^3}}{(2x-y)^{2n^2}}}$