Potenzen und Wurzeln

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1 Übung Potenzen und Wurzeln

1. $(-1)^{2n-1} = -1$

2. $-10^2 = -100$

3. $(-10)^{-3} = \dfrac{1}{(-10)^3} = -\dfrac{1}{1000}$

4. $((-2)^3)^2 = 64$

5. $(-1)^{-2n} = \dfrac{1}{(-1)^{2n}} = 1$

6. $-\left(\dfrac{3}{2}\right)^{-4} = -\left(\dfrac{2}{3}\right)^{-4} = -\dfrac{16}{81}$

7. $x^7 \cdot x^{-3} \cdot x^{-2} = x^{7-3-2} = x^2$

8. $\dfrac{y^3 \cdot x^{-2}}{(x \cdot y)^2} = \dfrac{y^3}{x^2 \cdot y^2 \cdot x^2} = \dfrac{y}{x^4}$

9. $\left(\dfrac{z^{-5}}{z^{-2}}\right)^{-2} = \left(\dfrac{z^2}{z^5}\right)^{-2} = \left(\dfrac{z^5}{z^2}\right)^2 = (z^3)^2 = z^6$

10. $\left(\dfrac{3}{5}\right)^4 \div \left(\dfrac{6}{25}\right)^4 = \left(\dfrac{3}{5} \cdot \dfrac{25}{6}\right)^4 = \left(\dfrac{5}{2}\right)^4 = \dfrac{625}{16}$

11. $a^{n-2} \cdot a^{1-n} = a^{n-2+1-n} = \dfrac{1}{a}$

12. $(a-b)^3 \cdot (b-a)^{-3} = \dfrac{(a-b)^3}{(-1 \cdot (a-b))^3} = -1$

13. $b^{2x-1} \cdot b^{2x+1} \div b^{3x-1} = b^{2x-1+2x+1-3x+1} = b^{x+1} = b \cdot b^x$

14. $\left(\dfrac{a^2}{b^3}\right)^{-2} \cdot \dfrac{5a^3}{2b^2} \cdot 2ab^{-4} = \left(\dfrac{b^3}{a^2}\right)^2 \cdot \dfrac{5a^3}{2b^2} \cdot \dfrac{2a}{b^4} = 5$

15. $\dfrac{4n^{-2}m^4}{5c^2x^{-3}} \div \dfrac{8m^3c^{-1}x}{15n^{-2}c} = \dfrac{4m^4x^3}{5c^2 \cdot n^2} \cdot \dfrac{15c \cdot c}{n^2 \cdot 8m^3x} = \dfrac{3mx^2}{2n^4}$

16. $\dfrac{u^2 - t^2}{2u^2 + 4ut + 2t^2} = \dfrac{(u-t) \cdot (u+t)}{2 \cdot (u+t) \cdot (u+t)} = \dfrac{u-t}{2 \cdot (u+t)}$

17. $(r + r^{-1})^2 - (r - r^{-1})^2 = r^2 + 2 + \dfrac{1}{r^2} - (r^2 - 2 + \dfrac{1}{r^2}) = 4$

18. $(2 - p)^3 = 8 - 12p + 6p^2 - p^3$

19. $\dfrac{a^{15} - a^{10}}{a^5} = \dfrac{a^5 \cdot (a^{10} - a^5)}{a^5} = a^{10} - a^5$

20. $\dfrac{\dfrac{a^2 - b^2}{ab + b^2}}{\dfrac{(a - b)^2}{ab^2}} = \dfrac{(a + b) \cdot (a - b)}{b \cdot (a + b)} \cdot \dfrac{ab \cdot b}{(a - b) \cdot (a - b)} = \dfrac{ab}{a - b}$