

Exponentialgleichungen - Teil 1

Klasse 10

Bestimme jeweils die Lösungsmenge:

 $\mathbb{G} = \mathbb{R}$

1. $2^{5x} = 8 \cdot 4^{x-1}$

2. $3^{x+1} \cdot 7^x = 81$

3. $9^{2x} = 9 \cdot 5^{1-x}$

4. $5^{x+1} = 2^x \cdot 7^{2x}$

5. $3^{2x+3} - 9^{x+2} + (\sqrt{3})^{4x+10} = 63$

6. $2^{6x-5} + 3 \cdot 4^{3x-2} - 8^{2x-1} = 384$

7. $\sqrt[x]{8^{3x+1}} = 2\sqrt{4^{x+2}}$

8. $\left(\frac{4}{5}\right)^{x+1} \cdot \left(\frac{5}{6}\right)^{x-1} = \left(\frac{6}{7}\right)^{x+2}$

9. $6^x + 6^{2x} = 56$

10. $(9^{2x-3})^{3x-4} = 81$

11. $\left(\frac{1}{2}\right)^{x-3} = \left(\frac{1}{3}\right)^{3-x}$

12. $5^{x+5} - \left(\frac{1}{3}\right)^{1-3x} = 0$

13. $2^{4x-2} + 4^{2x-3} = 5^{2-x}$

14. $3 \cdot 2^{4x+3} - 20 \cdot 4^{2x-1} = 3 \cdot 5^{-x}$

15. $11^{2x-7} \cdot 2^x = 3^{1-x}$

16. $2^{2x+5} - 3 \cdot 2^{x+2} = -1$

17. $3^{2x+1} + 5 \cdot 4^{x+2} = 8 \cdot 2^{2x-1} + 18 \cdot 9^{x+1}$

18. $2 \cdot 5^x - 4^{0,5} \cdot 5^{-x+1} = 0,25^{-1,5}$

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$$19. \quad 20 \cdot 3^{x-3} + 3^x + 129 \cdot 3^{x-4} - 3^5 = 3^{x-1}$$

$$20. \quad 4^{(x^2)} = 2\sqrt{2^{17x}} - (\sqrt{0,5})^{-17x} - \frac{3}{4} \cdot 32^{1,7x}$$

$$21. \quad 2(5 + 2^x) = \left(\frac{1}{9}\right)^{-1,5} - 2^{-x+3}$$

$$22. \quad (10^{x+2})^2 = (2^{x+10})^{10}$$

$$23. \quad \sqrt{8^{2x} + 4} + \sqrt{2 \cdot 8^{2x}} = 14$$

$$24. \quad \left(\frac{5}{7}\right)^{\frac{11x+9}{x}} = \left(\frac{1}{3}\right)^{\frac{3}{x}}$$

$$25. \quad \frac{2^{2x} \cdot 10^{x+3}}{4^{2x+1} \cdot 5^{2(x-1)}} = \frac{1}{4} \cdot 2,5^{x-3}$$

$$26. \quad 2^{x-1} \cdot 3^{2x+2} = 5^{3x-3} : 7^{4x-4}$$

$$27. \quad (10^{x+2})^x = (2^{x+10})^x$$

$$28. \quad 5^x \cdot x \cdot \sqrt[4]{4^x} = 1000$$

$$29. \quad 1000 \cdot 4^x + 100 \cdot 10^x = 25^x$$

$$30. \quad 8 \cdot 9^{x-3} = 3 \cdot 6^{\frac{2x+5}{x}}$$

$$31. \quad 3^{\lg(x^2)} + \frac{1}{18} \cdot 6^{2+\lg x} = 12 \cdot 4^{1+\lg x}$$

$$32. \quad 2^{(3^x)} = 3^{(4^x)}$$

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Ergebnisse

(ausführliche Lösungen in GM_LU011)

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|-----|-------------------------------|-----|---------------------------------|
| 1. | $\left\{\frac{1}{3}\right\}$ | 2. | $\{1,0825\dots\}$ |
| 3. | $\{0,63403\dots\}$ | 4. | $\{0,5409\dots\}$ |
| 5. | $\{-0,5\}$ | 6. | $\{2\}$ |
| 7. | $\left\{-\frac{1}{8}\right\}$ | 8. | $\{1,06432\dots\}$ |
| 9. | $\{1,086\dots\}$ | 10. | $\left\{2; \frac{5}{6}\right\}$ |
| 11. | $\{3\}$ | 12. | $\{5,42327\dots\}$ |
| 13. | $\{1,03709\dots\}$ | 14. | $\{-0,42123\dots\}$ |
| 15. | $\{2,7148\dots\}$ | 16. | $\{-2; -3\}$ |
| 17. | $\{-0,91027\dots\}$ | 18. | $\{1\}$ |
| 19. | $\{4\}$ | 20. | $\{0,25; 4\}$ |
| 21. | $\{-1; 3\}$ | 22. | $\{-25,83688\dots\}$ |
| 23. | $\left\{\frac{5}{6}\right\}$ | 24. | $\{0,072297\dots\}$ |
| 25. | $\{4\}$ | 26. | $\{0,24826\dots\}$ |
| 27. | $\{0; 1,44541\dots\}$ | 28. | $\{3; 1,4307\dots\}$ |
| 29. | $\{5,1215\dots\}$ | 30. | $\{5; -0,8155\dots\}$ |
| 31. | $\{26243,55\dots\}$ | 32. | $\{-1,6009\dots\}$ |