Answers: Solving exponential equations

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Summary

Answers to questions relating to solving exponential equations.

These are the answers to Questions: Solving exponential equations

Please attempt the questions before reading these answers!

Throughout this answer sheet, the natural logarithm $\log_e(x)$ is written as $\ln(x)$.

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1. The solution to $\sqrt[4]{x-4} = 5$ is $x = 629$.

2. The solution to $x^4 = 2^8$ is $x = 4$.

3. The solution to $11^x = 121^{x-1}$ is $x = 2$.

4. The solution to $x^{0.5}$ is $x = 529$.

5. The solution to $8^{2-x} = 2^{4+3x}$ is $x = \dfrac{1}{3}$.

6. The solution to $2^{3x} = 10$ is $x = \dfrac{\log_2(10)}{3}$.

7. The solution to $5^{3-x} = 625$ is $x = -1$.

8. The solution to $16^{2x} = 4^{x-1}$ is $x = -\dfrac{1}{3}$.

9. The solution to $7^{2-x} = 4^{2x+3}$ is $x = \log_{112}\left(\dfrac{49}{64}\right)$.

10. The solution to $16 = 8^{3-7x}$ is $x = \dfrac{5}{21}$.

11. The solution to $e^{3-8x} - 9 = 0$ is $x = \dfrac{3 - \ln(9)}{8}$.

12. The solution to $e^{4-3x} + 8 = 12$ is $x = \frac{4-\ln(4)}{3}$.

13. The solution to $\sqrt[3]{2^{4x} - 4} = 5$ is $x = \dfrac{\log_2(129)}{4}$.

14. The solution to $\sqrt[3]{e^{2x} - 13} = 81^{\frac{1}{4}}$ is $x = \dfrac{\ln(40)}{2}$.

15. The solution to $\dfrac{5xa^{-7}b^9}{9a^2b^{-10}} = \dfrac{25b^{19}}{3a^9}$ is $x = 15$.

16. The solution to $4^x \cdot 2^x = 64$ is $x = 2$.

17. The solution to $\dfrac{5^{x+1} \cdot 6^{x+1}}{3^{x+1}} = 100$ is $x = 1$.

18. The solution to $\dfrac{\left[\left(\frac{1}{2}\right)^x \cdot \left(\frac{-1}{4}\right)^x\right]}{\left(\frac{2}{3}\right)^x} = -\frac{27}{4096}$ is $x = 3$.

19. The solution to $3^{x+1} = 7^x$ is $x = \log_{7/3}(3)$.

20. The solution to $5^{x+1} + 5^x = 12$ is $x = \log_5(2)$.

21. The solution to $2^{3x-1} = 10^x$ is $x = \log_{4/5}(2)$.

22. The solution to $2^{2x} - 2^{x+3} - 2^4 = 0$ is $x = \log_2(4 + 4\sqrt{2})$.

Version history and licensing

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