

Solving Exponential Equations Using Logarithms Homework
Module 2, Unit 4, Lesson 7

Solve each exponential equation. Express the solution set in terms of a common or natural logarithm if necessary.

1. $10^x = 4$

2. $e^x = 7$

3. $5^x = 17$

4. $9^x = \frac{1}{\sqrt[3]{3}}$

5. $3e^{1-5x} = 456$

6. $3e^{4x} = 1977$

7. $e^{7x-3} - 2 = 16$

8. $7^{x+2} = 19$

$$9. e^{x-5} = \frac{1}{e^{3x}}$$

$$10. 3^{x-1} = 5^{2x+3}$$

$$11. 8^{x-1} = 4^{2-x}$$

$$12. 7^{2x+1} = 3^{x+2}$$

Mixed Review

Simplify. Answers should only contain positive exponents.

$$13. \left(\frac{2x^4y^{-4}z^{-3}}{3x^2y^{-3}z^4} \right)^3$$

$$14. 16^{\frac{-3}{4}}$$

$$15. \sqrt[4]{32x^{10}y^{12}}$$

$$16. (4)^{\frac{1}{3}}(16)^{\frac{1}{3}}$$

Answers

1. $x = \log 4$

2. $x = \ln 7$

3. $x = \frac{\log 17}{\log 5}$ or $x = \frac{\ln 17}{\ln 5}$

4. $x = -\frac{1}{6}$

5. $x = \frac{1 - \ln 152}{5}$

6. $x = \frac{\ln 659}{4}$

7. $x = \frac{\ln 18 + 3}{7}$

8. $x = \frac{\ln 19 - 2 \ln 7}{\ln 7}$ or $x = \frac{\log 19 - 2 \log 7}{\log 7}$

9. $x = \frac{5}{4}$

10. $x = \frac{3 \ln 5 + \ln 3}{\ln 3 - 2 \ln 5}$ or $x = \frac{3 \log 5 + \log 3}{\log 3 - 2 \log 5}$

11. $x = \frac{7}{4}$

12. $x = \frac{2 \ln 3 - \ln 7}{2 \ln 7 - \ln 3}$ or $x = \frac{2 \log 3 - \log 7}{2 \log 7 - \log 3}$

13. $\frac{8x^6}{27y^3z^{21}}$

14. $\frac{1}{8}$

15. $2x^2y^3\sqrt[4]{2x^2}$

16. 4