

Supplement #3

Solve the following equations for x .

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|--|--------------------------------|
| 17. $5^{2x} = 5^2$ | 18. $10^{-x} = 10^2$ |
| 19. $(2.5)^{2x+1} = (2.5)^5$ | 20. $(3.2)^{x-3} = (3.2)^5$ |
| 21. $10^{1-x} = 100$ | 22. $2^{4-x} = 8$ |
| 23. $3(2.7)^{5x} = 8.1$ | 24. $4(2.7)^{2x-1} = 10.8$ |
| 25. $(2^{x+1} \cdot 2^{-3})^2 = 2$ | 26. $(3^{2x} \cdot 3^2)^4 = 3$ |
| 27. $2^{3x} = 4 \cdot 2^{5x}$ | 28. $3^{5x} \cdot 3^x - 3 = 0$ |
| 29. $(1+x)2^{-x} - 5 \cdot 2^{-x} = 0$ | |
| 30. $(2-3x)5^x + 4 \cdot 5^x = 0$ | |
| 31. $2^x - \frac{8}{2^{2x}} = 0$ | 32. $2^x - \frac{1}{2^x} = 0$ |

Supplement #4

Simplify the following expressions.

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|-------------------------|---------------------------|
| 7. $\ln e^{-3}$ | 8. $e^{\ln 4.1}$ |
| 9. $e^{e^{\ln 1}}$ | 10. $\ln(e^{-2 \ln e})$ |
| 11. $\ln(\ln e)$ | 12. $e^{4 \ln 1}$ |
| 13. $e^{2 \ln x}$ | 14. $e^{x \ln 2}$ |
| 15. $e^{-2 \ln 7}$ | 16. $\ln(e^{-2} e^4)$ |
| 17. $e^{\ln x + \ln 2}$ | 18. $e^{\ln 3 - 2 \ln x}$ |

Solve the following equations for x .

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|-----------------------------------|----------------------------------|
| 19. $e^{2x} = 5$ | 20. $e^{1-3x} = 4$ |
| 21. $\ln(4-x) = \frac{1}{2}$ | 22. $\ln 3x = 2$ |
| 23. $\ln x^2 = 9$ | 24. $e^{x^2} = 25$ |
| 25. $6e^{-.00012x} = 3$ | 26. $4 - \ln x = 0$ |
| 27. $\ln 3x = \ln 5$ | 28. $\ln(x^2 - 5) = 0$ |
| 29. $\ln(\ln 3x) = 0$ | 30. $2 \ln x = 7$ |
| 31. $2e^{x/3} - 9 = 0$ | 32. $e^{\sqrt{x}} = \sqrt{e^x}$ |
| 33. $5 \ln 2x = 8$ | 34. $750e^{-.4x} = 375$ |
| 35. $(e^2)^x \cdot e^{\ln 1} = 4$ | 36. $e^{5x} \cdot e^{\ln 5} = 2$ |
| 37. $4e^x \cdot e^{-2x} = 6$ | 38. $(e^x)^2 \cdot e^{2-3x} = 4$ |

Answers: Supplement #3

17. 1 19. 2 21. $^{-1-x=2}$ -1 23. $1/5$ 25. $5/2$ 27. -1 29. 4 31. 1

25. $(2^{x-2})^2 = 2$; $2^{2x-4} = 2$; $2x-4=1$ $2x=5$ $x=5/2$

29. $2^{-x}(1+x-5)=0$; $2^{-x}(x-4)=0$; $x=4$

18. $x=-2$ 20. $x=8$ 22. $x=1$ 24. $x=1$ 26. $3^{8x+8}=3^1$; $x=-7/8$

28. $x=1/6$ 30. $5^x(6-3x)=0$; $5^x(2-x)=0$; $x=2$

32. $2^x - 2^{-x} = 0$; $x = -x = \emptyset$

Answers: Supplement #4

7. -3 9. e 11. 0 13. x^2

15. $1/49$ 17. $2x$ 19. $1/2 \ln 5$ 21. $\sqrt{e}=4-x$; $x=4-\sqrt{e}$ 23. $\pm\sqrt{e^9}$

25. $x = \frac{\ln 1/2}{-0.00012}$ 27. $5/3$ 29. $1 = \ln 3x$; $e=3x$; $x=e/3$

31. $3 \ln 1/2$ 33. $1/a e^{3/5}$ 35. $1/2 \ln 4$ 37. $e^{-x} = 3/2$; $x = -\ln 3/2$

8. 4.1 10. -2 12. 1 14. 2^x 16. 2 18. $3/x^2$

20. $1-3x = \ln 4$; $3x = 1 - \ln 4$; $x = \frac{1}{3} - \frac{\ln 4}{3} = \frac{1 - \ln 4}{3}$

22. $e^2 = 3x$; $x = \frac{e^2}{3}$ 24. $x^2 = \ln 25$; $x = \pm\sqrt{\ln(25)}$

26. $x = e^4$ 28. $x = \pm\sqrt{6}$ 30. $x = e^{7/2}$

32. $e^{\sqrt{x}} = \sqrt{e^x}$; $e^{2\sqrt{x}} = e^x$; $2\sqrt{x} = x$; $4x = x^2$; $0 = x(x-4)$
 $x = 0, 4$

34. $e^{-.4x} = .5$; $-.4x = \ln .5$; $x = \frac{\ln .5}{-.4} = \frac{-5 \ln 1/2}{2} = -\frac{5}{2} \ln(1/2)$

36. $e^{5x} = \frac{e}{5}$; $5x = \ln \frac{e}{5}$; $x = \frac{1}{5} \ln(\frac{e}{5})$

38. $2-x = \ln 4$; $x = 2 - \ln 4$