Problem Set 6: Differentiating Exponential Functions

Find the derivatives of the following functions.

Qu1. $7e^{7x}$

Qu2. $e^{\ln x} + x^{\ln e}$

Qu3. $\dfrac{e^x - e^{-x}}{e^x + e^{-x}}$

Qu4. $e^{\ln x^2} + \ln e^{x^2}$

Qu5. $e^{(4\sqrt{x} + x^2)}$

Qu6. $\ln\left(3te^{-t}\right)$

Qu7. $\ln\left(2e^{-t}\sin t\right)$

Qu8. $\ln\left(\dfrac{e^\theta}{1+e^\theta}\right)$

Qu9. $\ln\left(\dfrac{\sqrt{\theta}}{1+\sqrt{\theta}}\right)$

Qu10. $e^{(\cos t + \ln t)}$

Qu11. $e^{\sin t}\left(\ln t^2 + 1\right)$

Qu12. $(\cos\theta)^{\sqrt{2}}$

Qu13. $(\ln\theta)^{\pi}$

Qu14. $y = 7^{\sec\theta}\ln 7$

Qu15. $y = 3^{\tan\theta}\ln 3$

Qu16. $y = \log_2 5\theta$

Qu17. $y = \log_3\left(1+\theta\ln 3\right)$

Qu18. $y = \log_4 x + \log_4 x^2$

Qu19. $y = \log_{25} e^x - \log_5 \sqrt{x}$

Qu20. $y = \log_3 r \cdot \log_9 r$

Qu21. $y = \log_3\left(\left(\dfrac{x+1}{x-1}\right)^{\ln 3}\right)$

Qu22. $y = \log_5\sqrt{\left(\dfrac{7x}{3x+2}\right)^{\ln 5}}$

Qu23. $y = \theta\sin\left(\log_7\theta\right)$

Qu24. $y = \log_7\left(\dfrac{\sin\theta\cos\theta}{e^\theta 2^\theta}\right)$

Qu25. $y = \dfrac{\theta 5^\theta}{2 - \log_5\theta}$

Qu26. $y = \log_{10} e^x$

Qu27. $y = 3^{\log_2 t}$

Qu28. $y = 3\log_8\left(\log_2 t\right)$

Qu29. $y = \log_2\left(8t^{\ln 2}\right)$

Qu30. $y = t\log_3\left(e^{(\sin t)(\ln 3)}\right)$

Find dy/dx

Qu31. $\ln y = e^y \sin x$

Qu32. $\ln(xy) = e^{x+y}$

Qu33. $e^{2x} = \sin(x+3y)$

Qu34. $\tan y = e^x + \ln x$

Use Logarithmic Differentiation

Qu35. $y = (x+1)^x$

Qu36. $y = \left(\sqrt{t}\right)^t$

Qu37. $y = t^{\sqrt{t}}$

Qu38. $y = (\sin x)^x$

Qu39. $y = \sin x^x$