

## Answers for Exercise 31-56

$$31. f'(y) = -\frac{1}{2}\sqrt{10^{5-y}} \ln(10)$$

$$32. f'(z) = -\frac{e^{-z}(2z-1)}{2\sqrt{z}}$$

$$33. y' = -\frac{2^{-z-1}(2z \ln(2)-1)}{\sqrt{z}}$$

$$34. y' = \frac{4}{9}x(x^2 + 2)$$

$$35. h'(x) = \frac{x^2+6x-9}{2(x+3)^2 \sqrt{\frac{x^2+9}{x+3}}}$$

$$36. y' = \frac{4e^{2x}}{(e^{2x}+1)^2}$$

$$37. y' = -\frac{2x+3e^{3x}}{(x^2+e^{3x})^2}$$

$$38. h'(z) = -\frac{8b^4z}{(a+z^2)^5}$$

$$39. f'(x) = -\frac{3x^2}{2(x^3+1)^{3/2}}$$

$$40. f'(z) = -\frac{2e^z}{(e^z+1)^3}$$

$$41. w' = e^{-2t} (2t^2 + 2e^{2t}t + 4t + 3e^{2t} - 3)$$

$$42. h'(x) = 3 \cdot 2^{e^{3x}} e^{3x} \ln(2)$$

$$43. f'(x) = 2e^{-x^2} (15e^{x^2+5x} - x)$$

$$44. f'(x) = -2e^{-(x-1)^2} (x-1)$$

$$45. f'(w) = 2e^{w^2} (5w^3 + 8w)$$

$$46. f'(\theta) = -\frac{e^\theta (e^{2\theta} - 1)}{(e^{2\theta} + 1)^2}$$

$$47. y' = -\frac{3e^{-3t^2} t}{\sqrt{e^{-3t^2} + 5}}$$

$$48. z' = 9e^{27t} (t + e^{2t})^8 (3t + 5e^{2t} + 1)$$

$$49. f'(y) = e^{y^2} e^{e^{y^2}} (2y)$$

$$50. f'(t) = -8e^{2t} e^{-2e^{2t}}$$

$$51. f'(x) = 6ax (ax^2 + b)^2$$

$$52. f'(t) = abe^{bt}$$

$$53. f'(x) = -ae^{-bx}(bx - 1)$$

$$54. g'(\alpha) = -e^{\alpha e^{-2\alpha}} e^{-2\alpha} (2\alpha - 1)$$

$$55. y' = abc e^{b(-e^{-cx}) - cx}$$

$$56. y' = 2e^{-2x} (e^{2x} - 1) (e^{2x} + 1)$$