Worksheet - Derivatives of Exponential and Logarithmic Functions

Answer Key

1. $f'(x) = \frac{1}{x}$

2. $f'(x) = e^x$

3. $f'(x) = 4^x \cdot \ln 4$

4. $f'(x) = \frac{1}{x \cdot \ln 10}$

5. $f'(x) = 4^x \cdot \ln 4 - \frac{1}{x \ln 6}$

6. $f'(x) = \frac{1}{x \ln 4} + 16^x \cdot \ln 6$

7. $f'(x) = \pi e^x - 4^x \cdot \ln 4$

8. $f'(x) = \frac{6}{x}$

9. 4.44

10. 7

11. -29.3

12. 241.6

13. 17

14. $f'(x) = e^{-5x}(-3)$

15. $f'(x) = -e^{3x^2} \cdot 6x$

16. $f'(x) = \frac{e^x(5) - 5x \cdot e^x}{(e^x)^2}$

17. $f'(x) = \frac{e^x(27x^2) - 3x^3(e^x)}{(e^x)^2}$

18. $f'(x) = x^3 \cdot \frac{1}{x} + \ln x (3x^2)$

19. $f'(x) = \frac{1}{3x \cdot \ln 7} \cdot 3$

20. $f'(x) = \frac{1}{(x^2+1)\ln 3} \cdot (2x)$

21. $f'(x) = \frac{x \cdot \frac{1}{x \ln 10} + \log x}{x^2}$

22. $f'(x) = \frac{xe^{2x} \cdot 2 - e^{2x}}{x^2}$

23. $f'(x) = \frac{x^2 \cdot e^{2x} \cdot 4 - e^{4x}(2x)}{(x^2)^2}$

24. $f'(x) = x^2 \cdot \frac{1}{x^2+3x}(2x+3) + \ln(x^2+3x)(2x)$

25. $f'(x) = x^3 \cdot 8^x \cdot \ln 4 + 8^x(3x^2)$

26. $f'(x) = e^{3x}(8x) - 4x^4(e^{3x})(3)$

27. $f'(x) = x^5 \cdot \frac{1}{x^2 \ln 2} \cdot 2x + \log_2(x^2)(5x^4)$

28. $f'(x) = \frac{x^2(e^{2x})(2) - e^{2x}(2x)}{(x^2)^2}$