

**Worksheet: Derivatives of the Natural Exponential and Logarithmic Functions**

Compute each derivative using the short-cuts.

1.  $\frac{d}{dx}(e^x) =$

2.  $\frac{d}{dx}(x^e) =$

3.  $\frac{d}{dx}(5e^x) =$

4.  $\frac{d}{dx}(-e^x) =$

5.  $\frac{d}{dx}\left(e^x + x^{10} - \frac{1}{x}\right) =$

6.  $\frac{d}{dx}(\sqrt{x} - 600e^x) =$

7.  $\frac{d}{dx}(xe^x) =$

8.  $\frac{d}{dx}(e^x(x^2 - 7)) =$

9.  $\frac{d}{dx}\left(\frac{e^x}{x^7}\right) =$

10.  $\frac{d}{dx}\left(\frac{2e^x - 1}{5e^x + 9}\right) =$

11.  $\frac{d}{dx}(e^{2x}) =$

12.  $\frac{d}{dx}(e^{-x}) =$

13.  $\frac{d}{dx}(e^{x^5+3}) =$

14.  $\frac{d}{dx}\left(\frac{1}{e^x}\right) =$

$$15. \frac{d}{dx} (\ln x) =$$

$$16. \frac{d}{dx} (12 \ln x) =$$

$$17. \frac{d}{dx} (-\ln x) =$$

$$18. \frac{d}{dx} \left( 0.5 \ln x - 3x^{25} - \frac{2}{x^3} \right) =$$

$$19. \frac{d}{dx} (4x^{0.5} - 8 \ln x) =$$

$$20. \frac{d}{dx} (x^2 \ln x) =$$

$$21. \frac{d}{dx} [(\ln x) (x^5 + 10x^2 - 19)] =$$

$$22. \frac{d}{dx} \left( \frac{\ln x}{x^{20}} \right) =$$

$$23. \frac{d}{dx} \left( \frac{2 \ln x + 4}{\ln x - 1} \right) =$$

$$24. \frac{d}{dx} (\ln(3x)) =$$

$$25. \frac{d}{dx} (\ln(-x)) =$$

$$26. \frac{d}{dx} (\ln(x^2)) =$$

$$27. \frac{d}{dx} (\ln(2x^2 - 1)) =$$

$$28. \frac{d}{dx} \left( \frac{1}{\ln x} \right) =$$

$$29. \frac{d}{dx} (\ln(e^x)) =$$

$$30. \frac{d}{dx} (e^{\ln x}) =$$