

The Natural Exponential Function- HW Problems

Solve for x .

1. $e^{(2-3x)} - 4 = 0$

2. $\ln(x - 1) - \ln(x + 1) = 1$

Evaluate the following limits.

3. $\lim_{x \rightarrow \infty} \frac{e^{2x+e^x}}{e^{3x+1}}$

4. $\lim_{x \rightarrow 2^+} e^{\left(\frac{1}{2-x}\right)}$

Evaluate.

5. $\ln\left(\frac{1}{e}\right)$

6. $\ln\left[\ln\left(e^{(e^4)}\right)\right]$

7. $e^{-3 \ln(2)}$

Find the derivative.

8. $y = e^{\tan(x)} + e^{-3x}$

9. $y = \ln(e^x + 1)$

10. $y = e^{\ln(x^2+1)}$

11. $f(x) = \tanh(x) = \frac{e^x + e^{-x}}{e^x - e^{-x}}$

12. $y = t[\sin(e^{2t})]$

13. Find an equation of the tangent line to $y = (1 - x)e^{-x}$ at $(0,1)$.

14. Find the absolute maximum value of $f(x) = x - e^x$.

Evaluate the following integrals.

15. $\int (e^{-2x} - e^{-4x}) dx$

16. $\int_1^{\ln(3)} \frac{e^x + e^{-x}}{e^x - e^{-x}} dx$

17. $\int_0^{\frac{\pi}{2}} [\cos(x)] e^{\sin(x)} dx$

18. $\int_0^{\ln(2)} e^x [e^{(e^x)}] dx$

19. $\int e^t [\sin(e^t)] dt$

20. Find the values of x for which the graph of $f(x) = e^{-x^2}$ is concave down.