

Worksheet 11, Tuesday, April 10th, 2018

1. Prove that $\frac{d}{dx} \ln x = \frac{1}{x}$.
2. Let $y = x^{\sin x}$. Compute $\frac{dy}{dx}$.
3. Compute $\frac{d}{dx} \ln \left(\frac{x^{\frac{3}{4}} \sqrt{x^2 + 1}}{e^{\sec x}} \right)$.
4. Compute $\int \tan x \, dx$.
5. Compute $\int_0^{\ln 2} \frac{e^{3x}}{\sqrt{8 + e^{3x}}} \, dx$.
6. Compute $\int_0^1 \frac{e^x}{2 + e^x} \, dx$.
7. Compute $\int \frac{e^x - e^{-x}}{e^x + e^{-x}} \, dx$.
8. Compute $\int_e^{e^4} \frac{3}{x\sqrt{\ln x}} \, dx$.
9. Compute $\int \frac{1 + x^3}{x^4} \, dx$.
10. Compute $\int \frac{1}{e^x(1 + e^{-x})} \, dx$.
11. Compute $\int_e^{e^5} \frac{1}{x \ln x} \, dx$.
12. Find the equation of the tangent line to $y = \sin(e^x)$ at the point where the x -coordinate is $\ln \pi$.

Turn in your own solutions.