

Worksheet 10, Tuesday, April 3rd, 2018

Differentiation

1. Compute $g''(x)$ when $g(x) = \int_x^7 \sqrt{e^t + 3} dt$. Simplify.
2. Compute $f'(x)$ where $f(x) = \sqrt{\cos(x^2 + e^x)} + \cos \sqrt{x^2 + e^x} + e^{\sqrt{x^2 + \cos x}}$.
3. Suppose that $e^{xy} = 2 - xy$. Compute the derivative $\frac{dy}{dx}$.
4. Differentiate $f(x) = \frac{1 + e^{-2x}}{1 - e^{7x}}$. Simplify.

Integration For 5-11, compute each integral.

5. $\int \frac{(1 + e^x)^2}{e^x} dx$
6. $\int (e^x + e^{-x})(e^x - e^{-x}) dx$ Do this 2 different ways. Show they are equivalent answers.
7. $\int (e^{4x} + e^{-9x})^2 dx$
8. $\int \frac{\sqrt{1 + e^{-x}}}{e^x} dx$
9. $\int \frac{we^{w^2}}{(17 + e^{w^2})^3} dw$
10. $\int \frac{e^{-\frac{1}{x}}}{7x^2} dx$
11. $\int \frac{e^{-2x}}{(1 - e^{-2x})^{\frac{5}{7}}} dx$
12. Compute the area bounded between $y = e^x$, $y = e^{-x}$ and $x = 2$.
13. Find the function $f(x)$ that satisfies $f'(x) = \frac{e^{\sqrt{\tan x}} \sec^2 x}{\sqrt{\tan x}}$ and $f\left(\frac{\pi}{4}\right) = 1$.

Turn in your own solutions.