

- Please see the course webpage for the answer key.

1. Compute $\int_e^{e^3} \frac{4}{x(\ln x)^2} dx$.

2. Compute $\int_{\ln 3}^{\ln 8} \frac{e^x}{\sqrt{1+e^x}} dx$.

3. Compute $\int_{\ln 2}^{\ln 3} \frac{1}{e^{2x}(1-e^{-2x})^2} dx$.

4. Compute $\int \frac{x}{(3x+1)^2} dx$.

5. Compute $\int_{\frac{\pi}{18}}^{\frac{\pi}{9}} \tan(3x) dx$.

6. Consider $G(x) = \frac{1}{\sin \sqrt{e^x + e^7}} + \frac{1}{e^{\sqrt{x^2 + 7 \sin x}}} + \frac{1}{\sqrt{7 + e^{\sin x}}}$ Compute $G'(x)$. Do not simplify here.

7. Consider $F(x) = \sin(\ln(1+x)) - \frac{1}{1 + \ln(1+3x)}$ Compute the equation of the tangent line to the curve $F(x)$ at the point where $x = 0$.