

- Please see the course webpage for the answer key.

1. Compute $\int_0^{e^5} \frac{1}{x(25 + (\ln x)^2)} dx$.

2. Compute $\int_{\frac{\pi}{3}}^{\frac{\pi}{2}} \frac{\tan x}{(\ln(\cos x))^2} dx$.

3. Compute $\int_0^3 \frac{1}{\sqrt{x}(x+1)} dx$.

4. Compute $\int_1^7 \frac{15-x}{x^2-6x-7} dx$.

5. Compute $\int_0^1 \frac{1}{e^x - e^{-x}} dx$.

6. Consider the sequence $\left\{ \left(\frac{n}{n+1} \right)^n \right\}_{n=1}^{\infty}$. Compute $\lim_{n \rightarrow \infty} \left(\frac{n}{n+1} \right)^n =$