MATH 1101Y 2009 Quiz 10 (b)

Evaluate the indefinite integrals.

1. (1.5 pts) $\int e^x \left(e^x + 3\right)^5 dx$

   Solution: Let $u = e^x + 3$. $du = e^x dx$.

$$\begin{aligned} & \int e^x \left(e^x + 3\right)^5 dx \\ = & \int u^5 du = \frac{u^6}{6} + C. \end{aligned}$$

□

2. (1.5 pts) $\int \frac{1}{x \ln x} dx$

   Solution: Let $u = \ln x$. $du = \frac{1}{x} dx$.

$$\begin{aligned} & \int \frac{1}{x \ln x} dx \\ = & \int \frac{1}{u} du = \ln(u) + C \\ = & \ln(\ln x) + C. \end{aligned}$$

□

3. (2 pts) $\int \frac{x}{\sqrt{1-x^4}} dx$

   Solution: Let $u = x^2$. $du = 2x dx$.

$$\begin{aligned} & \int \frac{x}{\sqrt{1-x^4}} dx \\ = & \frac{1}{2} \int \frac{2x}{\sqrt{1-x^4}} dx \\ = & \frac{1}{2} \int \frac{1}{\sqrt{1-u^2}} du \\ = & \frac{1}{2} \sin^{-1}(u) + C \\ = & \frac{1}{2} \sin^{-1}\left(x^2\right) + C. \end{aligned}$$

□