

習題集 5

(對應 [張旭微積分](#) 積分前篇重點五：微積分基本定理 I：先微再積型)

1. Evaluate $\int_1^2 2x + 3x^2 + \frac{1}{2\sqrt{x}} dx$.
2. Evaluate $\int_2^3 x^{\frac{4}{3}} - 3\frac{1}{x^5} dx$.
3. Evaluate $\int_1^2 e^{3x} dx$.
4. Evaluate $\int_{-1}^1 \cos^2 x + \sec^2 x dx$. [Hint: Half-angle Formula]
5. Evaluate $\int_0^1 (2x-1)^{100} dx$.
6. Evaluate $\int_2^3 \sin x + \sin^2 x + \sin^3 x dx$. [Hint: Multiple-angle Formula]
7. Evaluate $\int_{\frac{\pi}{4}}^{\frac{\pi}{3}} \sin x \cos 3x dx$. [Hint: Product-to-sum Formula]
8. Find $\lim_{p \rightarrow \infty} \int_0^1 x^p dx$.
9. Evaluate $\int_1^2 2xe^{x^2} dx$. [Hint: The integrand is a function obtained by applying Chain Rule to some function]
10. Evaluate $\int_{\frac{\pi}{6}}^{\frac{\pi}{3}} \frac{\cos x}{\sin^4 x} dx$. [Hint: The integrand is a function obtained by applying Chain Rule to some function]