

7.4 Integration of Rational Functions by Partial Fractions

單選題

1. Evaluate the integral $\int_0^1 \frac{x^2 + x + 2}{x^2 + 1} dx$.

(A) $2 - 2\ln 2$; (B) $\frac{4\ln 2 - \pi}{6}$; (C) $\frac{\pi + 4 + 2\ln 2}{4}$; (D) $\frac{\pi + 8 - \ln 2}{8}$.

Ans: C [99 學年度]

填充題

1. The integral $\int_0^1 \frac{x-4}{(x+1)(x^2+4)} dx = \underline{\hspace{2cm}}$.

Ans: $\frac{1}{2}\ln 5 - 2\ln 2$ (or $\ln \frac{\sqrt{5}}{4}$) [102 學年度]

2. $\int \frac{1}{x^8-x} dx = \underline{\hspace{2cm}}$.

Ans: $\left(\frac{1}{7}\ln \left|\frac{x^7-1}{x^7}\right|\right) + C$ or $\left(\frac{1}{7}\ln \left|1 - \frac{1}{x^7}\right|\right) + C$ [103 學年度]