MAT126.R02: QUIZ 2

SOLUTIONS

Evaluate the following integrals:

(a) $\displaystyle\int \frac{\sin(\ln 2x)}{x}\,dx = \int \sin u\,du = -\cos u + C = -\cos(\ln 2x) + C$

using the substitution $u = \ln 2x$, $du = (\ln 2x)'dx = 2\dfrac{1}{2x}dx = \dfrac{1}{x}dx$ *(chain rule)*

(b) $\displaystyle\int_0^{\ln\pi} e^x \cos(e^x)\,dx = \int_1^{\pi} \cos u = \sin u|_1^{\pi} = \sin\pi - \sin 1 = 0 - \sin 1 = -\sin 1$

using the substitution $u = e^x$, $du = (e^x)'dx = e^x dx$, *and* $u = e^0 = 1$ *when* $x = 0$, $u = e^{\ln\pi} = \pi$ *when* $x = \ln\pi$