An offprint from
The Mathematical Gazette

Volume 95 Number 533 July 2011

A comment on Schnell and Mendoza

Schnell and Mendoza [1] derive the interesting formula $\int f^{-1}(y)\,dy = xf(x) - \int f(x)\,dx$, where $y = f(x)$. It can also be obtained from the standard A-level 'trick' of treating $\int g(x)\,dx$ as $\int 1.g(x)\,dx$. Using this method

$$\int f^{-1}(y)\,dy = \int 1.\,f^{-1}(y)\,dy = yf^{-1}(y) - \int y\left[f^{-1}(y)\right]'dy.$$

We note that since $f'(x) = \dfrac{dy}{dx}$ and $f^{-1}(y) = x$, $\left[f^{-1}(y)\right]' = \dfrac{dx}{dy} = \dfrac{1}{f'(x)}$, giving $\int f^{-1}(y)dy = xf(x) - \int \dfrac{y}{f'(x)}dy = xf(x) - \int f(x)dx$, since $\dfrac{dy}{f'(x)} = dx$.

Reference

1. S. Schnell and C. Mendoza, A formula for integrating inverse functions, *Math. Gaz.*, **84** (March 2000) pp. 103-104.

COLIN FOSTER
King Henry VIII School, Warwick Road, Coventry CV3 6AQ
e-mail: *c@foster77.co.uk*