MAT126.R01: QUIZ 5

SOLUTIONS

Evaluate the following integrals:

(a) $\displaystyle\int \frac{1}{\sqrt{3x+1}}\,dx = \int \frac{1}{\sqrt{u}}\,\frac{du}{3} = \frac{1}{3}\int u^{-1/2}\,du = \frac{1}{3}\frac{u^{1/2}}{1/2} + C = \frac{2}{3}\sqrt{u} + C = \frac{2}{3}\sqrt{3x+1} + C$

using the substitution $u = 3x + 1$, $du = (3x + 1)'dx = 3dx$ *(hence,* $dx = \dfrac{du}{3}$*)*

(b) $\displaystyle\int 2e^{\sin^2 x}\sin x\cos x\,dx = \in e^u\,du = e^u + C = e^{\sin^2 x} + C$

using the substitution $u = \sin^2 x$, $du = (\sin^2 x)dx = 2\sin x\cos x\,dx$ *(chain rule)*