



Integration by Substitution 1

A Level Further A



Part A Integrate $\sin(c\theta)$

Find $\int \sin(c\theta) d\theta$.

The following symbols may be useful: c, k, theta

Part B Integrate $e^{\alpha v}$

Find $\int e^{\alpha v} dv$.

The following symbols may be useful: alpha, e, k, v



Integration by Substitution 2

A Level Further A



Part A Integrate $(bv + c)^2$

Find $\int (bv + c)^2 dv$.

The following symbols may be useful: b , c , k , v

Part B Integrate $a(y - b)^3$

Find $\int_0^b a(y - b)^3 dy$.

The following symbols may be useful: a , b



Integration by Substitution 3

A Level Further A



Part A Integrate $3/(z+1)^2$

Find $\int_0^2 \frac{3}{(z+1)^2} dz$.

Part B Integrate $e^{-\alpha x}/(1+e^{-\alpha x})^4$

Find $\int \frac{e^{-\alpha x}}{(1+e^{-\alpha x})^4} dx$.

The following symbols may be useful: α , e , k , x



Integration by Substitution 4

A Level Further A



Part A Integrate $1/(b(x + a))$

Find $\int_0^a \frac{1}{b} \frac{1}{(x + a)} dx$.

The following symbols may be useful: a, b, k, x

Part B Integrate $x/(1 + x^2)$

Find $\int_0^1 \frac{x}{1 + x^2} dx$.

The following symbols may be useful: k, x