Integrals

1 Integration by parts

— Find a primitive of $x \longmapsto x^2 \mathrm{e}^{2x}$ using integrations by parts

— Determine $\displaystyle\int_0^x \cos(t)\mathrm{e}^t \mathrm{d}t$

2 Substitution

— $\displaystyle\int_1^3 \frac{\mathrm{d}t}{\sqrt{t}(1+t)}$ by using the substitution $u = \sqrt{t}$

— $\displaystyle\int_2^4 \frac{\ln\big(\ln(t)\big)}{t\ln(t)}\mathrm{d}t$ by using the substitution $u = \ln(t)$

3 Substitution + integration by parts

— $\displaystyle\int_0^{\frac{\pi}{2}} \sin^3(t)\mathrm{e}^{\cos(t)}\mathrm{d}t$ by using the substitution $u = \cos(t)$

— $\displaystyle\int_0^{\sqrt{\pi}} x^5 \sin(x^2)\mathrm{d}x$ by using the substitution $u = x^2$

— $\displaystyle\int_0^1 x^3 \mathrm{e}^{x^2}\mathrm{d}x$ by using the substitution $u = x^2$