THE UK UNIVERSITY INTEGRATION BEE
2021/22

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ROUND TWO GROUP ROUND
Saturday, 20 November 2021

Sponsored by

Jane Street

1. $\displaystyle\int_0^1 \arctan^2(x)\mathrm{d}x$

2. $\displaystyle\int_2^\infty \ln\left(\frac{\lfloor x\rfloor^2 - 1}{\lfloor x\rfloor^2}\right)\mathrm{d}x$

3. $\displaystyle\int_0^\pi \frac{\mathrm{d}x}{(2+\cos(x))^3}$

4. $\displaystyle\int_0^\pi \ln(\sin x)\cos^3(x)\mathrm{d}x$

5. $\displaystyle\int \frac{t^2+1}{t^4+1}\mathrm{d}t$

6. $\displaystyle\int_0^\infty \frac{\sin ax \sin bx}{x}\mathrm{d}x$ for $a > b > 0$

7. $\displaystyle\int_0^\infty \frac{\arctan(x)}{x^{\ln x + 1}}\mathrm{d}x$

8. $\displaystyle\int_0^{\frac{\pi}{4}} \sqrt{\tan x}\sqrt{1-\tan x}\,\mathrm{d}x$

9. $\displaystyle\int_0^\pi \frac{x\sin x}{3+\cos^2 x}\mathrm{d}x$

10. $\displaystyle\int_0^\infty \sin(x^2)\mathrm{d}x$