

MATH 53 12 March 08

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① Last time, we saw that $\int_0^1 \int_0^1 \frac{1}{1-xy} dx dy = \sum_{n=1}^{\infty} \frac{1}{n^2}$.

(If you were not here, be sure to think about why this is true.) Evaluate this integral, for example using the following steps:

- rotate the square by $x = \frac{u+v}{\sqrt{2}}$, $y = \frac{u-v}{\sqrt{2}}$
- pick the correct order for the integrals: I believe you should do $\int_{-}^{+} \int_{-}^{+} \dots du dv$ the integral with respect to u on the inside.
- You will need some trigonometry. I needed the fact that

$$\arctan(\tan \theta + \sec \theta) = \frac{\pi}{4} + \frac{\theta}{2}$$