MATH 2500 QUIZ 4 SOLUTION (20260225)
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Total time: 10 minutes.

Problem 1 (5 points). Calculate the following iterated integral:

$$\int_0^1 \int_y^1 x \, \mathrm{d}x \, \mathrm{d}y$$

$$= \int_0^1 \frac{1}{2}x^2 \Big|_{x=y}^1 \mathrm{d}y = \frac{1}{2}\int_0^1 (1-y^2)\,\mathrm{d}y = \frac{1}{2}(y - \frac{1}{3}y^3)\Big|_{y=0}^1 = \frac{1}{3}$$

Problem 2 (5 points). Write an iterated integral to represent the following double integral

$$\iint_D \sin(xy^2)\,\mathrm{d}A$$

where D is the region bounded by $x = 0$, $y = 2$, $y = 2x$. DO NOT calculate the iterated integral.

$$\int_0^1 \int_{2x}^2 \sin(xy^2)\,\mathrm{d}y\,\mathrm{d}x$$

or

$$\int_0^2 \int_0^{y/2} \sin(xy^2)\,\mathrm{d}x\,\mathrm{d}y$$