MATH 2500 QUIZ 5 SOLUTION (20260304)
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Total time: 10 minutes.

Problem 1 (4 points). Exchange the order of the following iterated integral

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

You DO NOT need to calculate this integral.

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

Problem 2 (6 points). Let D be the region between $x^2+y^2=1$ and $x^2+y^2=9$, to the left of the y-axis. Calculate

$$\iint_D (x^2+y^2)\,\mathrm{d}A$$

$$\int_1^3 \int_{\pi/2}^{3\pi/2} r^2 \cdot r\,\mathrm{d}\theta\,\mathrm{d}r = \int_1^3 r^3\,\mathrm{d}r \cdot \int_{\pi/2}^{3\pi/2} \mathrm{d}\theta = \frac{r^4}{4}\Big|_1^3 \cdot \pi = 20\pi$$