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1. (2 pts) Evaluate the triple integral

$$\iiint_{\mathbf{E}} xyz \, dV$$

where  $\mathbf{E}$  is the solid:  $0 \leq z \leq 5$ ,  $0 \leq y \leq z$ ,  $0 \leq x \leq y$ .

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2. (2 pts) Find the volume of the solid enclosed by the paraboloids  $z = 16(x^2 + y^2)$  and  $z = 32 - 16(x^2 + y^2)$ .

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3. (2 pts) Find the average value of the function  $f(x, y, z) = x^2 + y^2 + z^2$  over the rectangular prism  $0 \leq x \leq 1$ ,  $0 \leq y \leq 3$ ,  $0 \leq z \leq 3$

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4. (2 pts) Find the mass of the rectangular prism  $0 \leq x \leq 4$ ,  $0 \leq y \leq 1$ ,  $0 \leq z \leq 1$ , with density function  $\rho(x, y, z) = x$ .

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