
1.(1 pt) Evaluate the triple integral

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

where \mathbf{E} is the solid: $0 \leq z \leq 6$, $0 \leq y \leq z$, $0 \leq x \leq y$.

2.(1 pt) Find the volume of the solid enclosed by the paraboloids $z = 1 - (x^2 + y^2)$ and $z = 8 - 1(x^2 + y^2)$.

3.(1 pt) Find the average value of the function $f(x, y, z) = x^2 + y^2 + z^2$ over the rectangular prism $0 \leq x \leq 5$, $0 \leq y \leq 4$, $0 \leq z \leq 4$

4.(1 pt) Find the mass of the rectangular prism $0 \leq x \leq 2$, $0 \leq y \leq 2$, $0 \leq z \leq 3$, with density function $\rho(x, y, z) = x$. You might find formula No. 13 on page 1014 of the text helpful.

5.(1 pt) Use cylindrical coordinates to evaluate the triple integral $\iiint_{\mathbf{E}} \sqrt{x^2 + y^2} \, dV$, where \mathbf{E} is the solid bounded by the circular paraboloid $z = 1 - 9(x^2 + y^2)$ and the xy -plane.

6.(1 pt) Use spherical coordinates to evaluate the triple integral $\iiint_{\mathbf{E}} x^2 + y^2 + z^2 \, dV$, where \mathbf{E} is the ball: $x^2 + y^2 + z^2 \leq 49$.

7.(1 pt)

Match the integrals with the type of coordinates which make them the easiest to do. Put the letter of the coordinate system to the left of the number of the integral.

- 1. $\int \int \int_{\mathbf{E}} z \, dV$ where \mathbf{E} is: $1 \leq x \leq 2$, $3 \leq y \leq 4$, $5 \leq z \leq 6$
- 2. $\int \int_D \frac{1}{x^2 + y^2} \, dA$ where D is: $x^2 + y^2 \leq 4$
- 3. $\int \int \int_{\mathbf{E}} z^2 \, dV$ where \mathbf{E} is: $-2 \leq z \leq 2$, $1 \leq x^2 + y^2 \leq 2$
- 4. $\int_0^1 \int_0^{y^2} \frac{1}{x} \, dx \, dy$
- 5. $\int \int \int_{\mathbf{E}} dV$ where \mathbf{E} is: $x^2 + y^2 + z^2 \leq 4$, $x \geq 0$, $y \geq 0$, $z \geq 0$

- A. polar coordinates
 - B. cartesian coordinates
 - C. cylindrical coordinates
 - D. spherical coordinates
-

8.(1 pt) A volcano fills the volume between the graphs $z = 0$ and $z = \frac{1}{(x^2 + y^2)^{10}}$, and outside the cylinder $x^2 + y^2 = 1$. Find the volume of this volcano.
