

Lesson 14

July 8, 2016

1. Evaluate $\int_1^2 \int_0^{2z} \int_0^{\ln x} x e^{-y} dy dx dz$.

Answer: $\frac{5}{3}$

2. Evaluate $\int \int \int_E e^{z/y} dV$, where $E = \{(x, y, z) | 0 \leq y \leq 1, y \leq x \leq 1, 0 \leq z \leq xy\}$.

Answer: $\frac{e}{2} - \frac{7}{6}$

3. Find the volume of the solid bounded by $y = x^2 + z^2$ and $y = 8 - x^2 - z^2$.

Answer: 16π

4. Rewrite $\int_0^1 \int_{\sqrt{x}}^1 \int_0^{1-y} f(x, y, z) dz dy dx$ in the other five orders.

Answer: $\int_0^1 \int_0^{y^2} \int_0^{1-y} f(x, y, z) dz dx dy$

$$\int_0^1 \int_0^{1-y} \int_0^{y^2} f(x, y, z) dx dz dy$$

$$\int_0^1 \int_0^{1-z} \int_0^{y^2} f(x, y, z) dx dy dz$$

$$\int_0^1 \int_0^{1-\sqrt{x}} \int_{\sqrt{x}}^{1-z} f(x, y, z) dy dz dx$$

$$\int_0^1 \int_0^{(1-z)^2} \int_{\sqrt{x}}^{1-z} f(x, y, z) dy dx dz$$