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Cálculo II

Integral Iterada

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

Integração (x)

$$\int_0^2 \int_0^{z^2} \int_0^{y-z} (2x - y)\, dx\, dy\, dz = \int_0^2 \int_0^{z^2} (x^2 - xy) \Big|_0^{y-z} dy\, dz$$

$$\int_0^2 \int_0^{z^2} \left((y-z)^2 - (y-z) \cdot y \right) dy\, dz$$

$$\int_0^2 \int_0^{z^2} (-yz + z^2)\, dy\, dz$$

Integração (y)

$$\int_0^2 \int_0^{z^2} (-yz + z^2)\, dy\, dz = \int_0^2 \left(-\frac{y^2}{2} z + z^2 y \right) \Big|_0^{z^2} dz$$

$$\int_0^2 \left(-\frac{z^5}{2} + z^4 \right) dz$$

Integração (z)

$$\int_0^2 \left(-\frac{z^5}{2} + z^4\right) dz = \left(-\frac{z^6}{12} + \frac{z^5}{5}\right)_0^2$$

$$\left(-\frac{16}{3} + \frac{32}{5}\right) = \frac{16}{15}$$ (x)

$$\int_0^2 \int_0^{z^2} \int_0^{y-z} (2x - y)\, dx\, dy\, dz = \frac{16}{15}$$

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b- $\int_0^1 \int_y^{2y} \int_0^{x+y} (6xy)\, dz\, dx\, dy$

$\int_0^{x+y} 6xy\, dx = 3y(x+y)^2$

$\int_0^1 \int_y^{2y} 3y(x+y)^2\, dy\, dz$

$\int_y^{2y} 3y(x+y)^2\, dy = \frac{45y^4}{4} + 14xy^3 + \frac{9x^2y^2}{2}$

$\int_0^1 \left(\frac{45y^4}{4} + 14xy^3 + \frac{9x^2y^2}{2}\right) dz$

$\int_0^1 \int_y^{2y} \int_0^{x+y} (6xy)\, dz\, dx\, dy = 14y^3x + \frac{45y^4}{4} + \frac{9y^2x^2}{2}$ =