



(1) Calcule as integrais iteradas:

(a) $\int_1^4 \int_0^2 (6x^2y - 2x) dy dx$

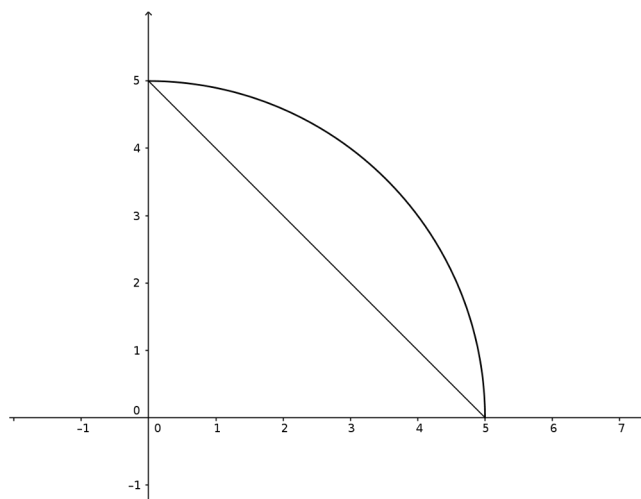
(b) $\int \int_R \frac{xy^2}{x^2 + 1} dA$, onde $R = [0, 1] \times [-3, 3]$.

(c) $\int \int_R xe^{xy} dA$, onde $R = [1, 3] \times [0, 1]$.

(d) $\int_0^1 \int_x^{2x} (2x + 4y) dy dx$.

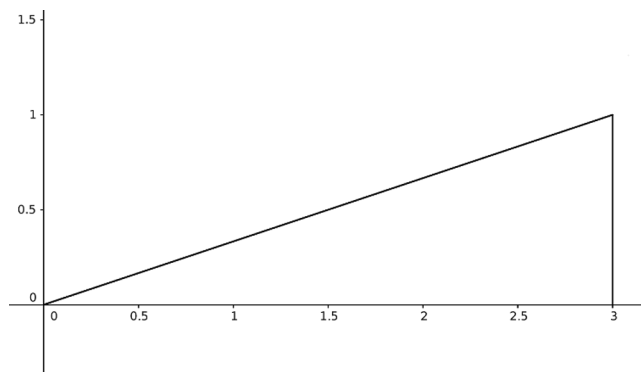
(e) $\int_1^e \int_{\ln x}^1 x dy dx$.

(2) Calcule $\int \int_R y dA$, onde R é a região do primeiro quadrante compreendida pelo círculo $x^2 + y^2 = 25$ e a reta $x + y = 5$.

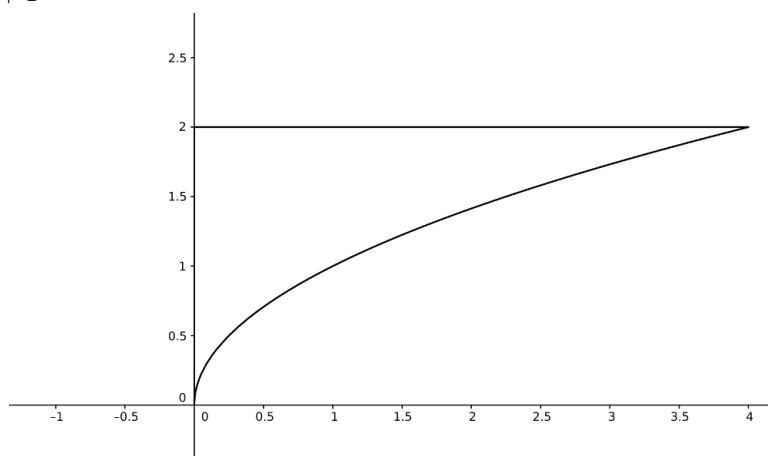


(3) Mude a ordem de integração e calcule as integrais abaixo:

(a) $\int_0^1 \int_{3y}^3 e^{x^2} dx dy$

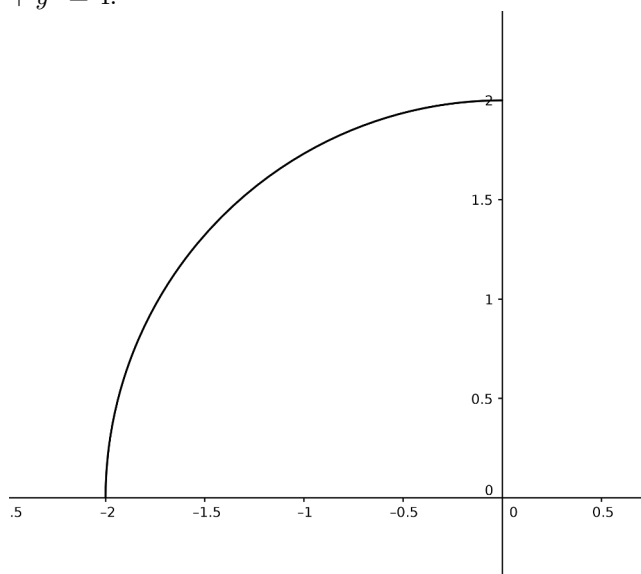


(b) $\int_0^4 \int_{\sqrt{x}}^2 \frac{1}{y^3 + 1} dy dx$

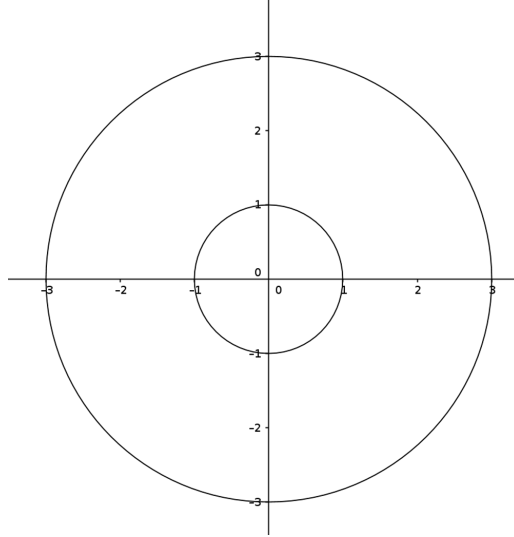


(4) Usando coordenadas polares, calcular:

(a) $\iint_R \frac{dA}{1 + x^2 + y^2}$, onde R é a região do segundo quadrante delimitada pela circunferência $x^2 + y^2 = 4$.



- (b) $\iint_R \sqrt{x^2 + y^2} dA$, onde R é a região delimitada por $x^2 + y^2 = 1$ e $x^2 + y^2 = 9$.



- (5) Calcule as integrais triplas abaixo:

(a) $\iiint_B 2y \sin(yz) dV$ onde $B = [0, \pi] \times [0, \frac{\pi}{2}] \times [0, \frac{\pi}{3}]$.

(b) $\int_1^3 \int_x^{x^2} \int_0^{\ln z} x e^y dy dz dx$.

(c) $\int_{1/3}^{1/2} \int_0^\pi \int_0^1 z x \sin(xy) dz dy dx$.

- (6) Calcule $\iiint_E x^2 + y^2 dV$, onde E é o cilindro $x^2 + y^2 \leq 1$, $1 \leq z \leq 4$.

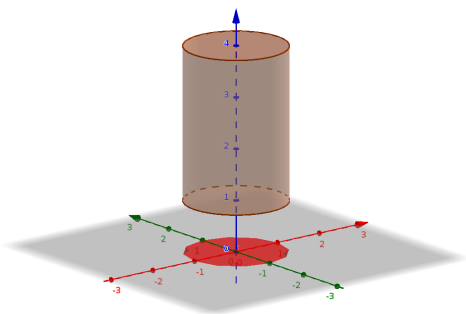


FIGURE 1. Região E

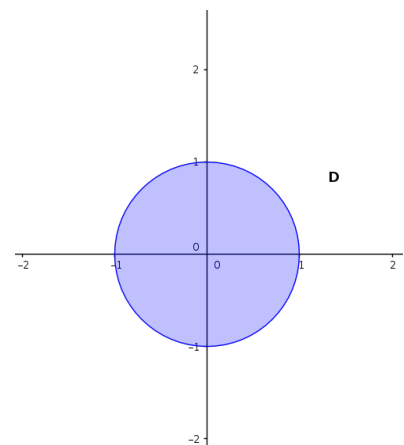


FIGURE
2. Projeção
no plano XY

- (7) Calcular $\int \int \int_E xy dV$, onde E é a região delimitada pelos planos $y = 0$, $y = 4$, $z = 0$ e por $z = 4 - x^2$.

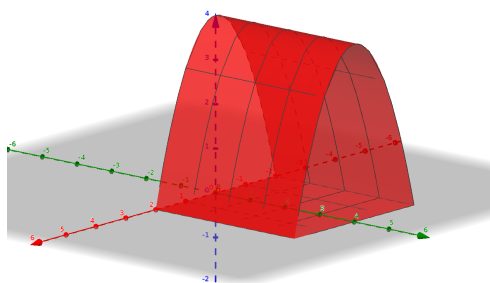


FIGURE 3. Região E

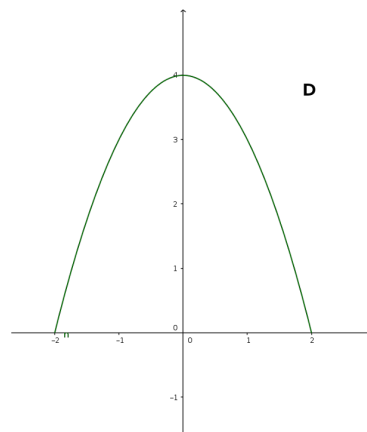
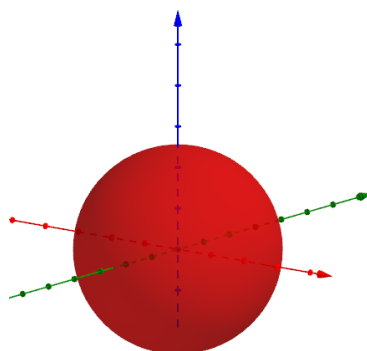
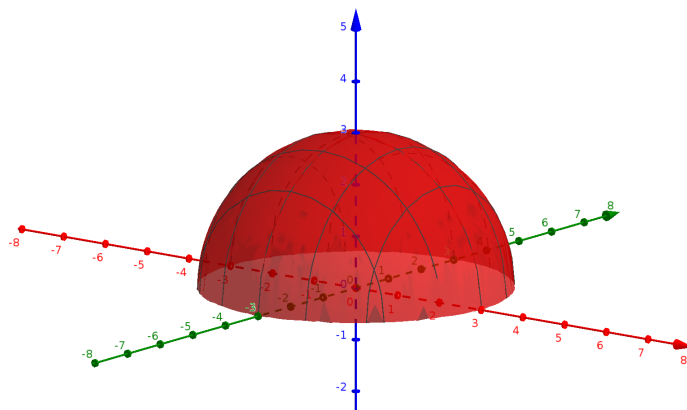


FIGURE
4. Projeção
no plano ZX

- (8) Calcular $\int \int \int_E x^2 + y^2 + z^2 dV$, onde E é a esfera $x^2 + y^2 + z^2 = 25$.



- (9) Calcular $\int \int \int_E (9 - x^2 - y^2) dV$, onde E é a semi-esfera $x^2 + y^2 + z^2 = 9$, $z \geq 0$.



Gabarito

- (1) (a) 222
 (b) $9 \ln 2$
 (c) $e^3 - e - 2$
 (d) $\frac{8}{3}$
 (e) $\frac{e^2 - 3}{4}$
- (2) $\frac{125}{6}$
- (3) a) $\frac{1}{6}(e^9 - 1)$
 b) $\frac{\ln 9}{3}$
- (4) a) $\frac{\pi}{4} \ln 5$
 b) $\frac{52\pi}{3}$
- (5) b) $\pi^2 - 6\sin(\frac{\pi^2}{6})$
 c) $\frac{118}{3}$
 d) $\frac{\pi - 6 + 3\sqrt{3}}{12\pi}$
- (6) $\frac{3\pi}{2}$
- (7) 0
- (8) 2500π
- (9) $\frac{486\pi}{5}$.