MAT216 – Cálculo Diferencial e Integral III
Respostas da Lista de Exercícios 5

1. (a) 1/3 (b) 1 (c) $2\sqrt{3} - 38/3$ (d) $\pi^2/4$ (e) 2 (f) 2π (g) 6 (h) $t^{-3}(e^{t^2} - e^t) + t^{-2} - t^{-1}$ (i) 1/6

2. (a) $-3\pi/2$ (b) $3/2 + \cos 1 + \sin 1 - \cos 2 - 2\sin 2$ (c) $e - 1/e$ (d) $\frac{7}{3}\ln 2$ (e) $\pi^2 - \frac{40}{9}$

3. 6

4. 80/3

5. (a) 8/3 (b) 2

6. (a) $\int_0^1 \int_x^1 f(x,y)\,dydx$ (b) $\int_0^4 \int_{x/2}^{\sqrt{x}} f(x,y)\,dydx$ (c) $\int_1^2 \int_1^{y^2} f(x,y)\,dxdy$
(d) $\int_0^1 \int_{2-y}^{1+\sqrt{1-y^2}} f(x,y)\,dxdy$ (e) $\int_{-1}^0 \int_{-\sqrt{4y+4}}^{\sqrt{4y+4}} f(x,y)\,dxdy + \int_0^8 \int_{-\sqrt{4y+4}}^{2-y} f(x,y)\,dxdy$
(f) $\int_0^1 \int_{e^y}^{e} f(x,y)\,dxdy$ (g) $\int_{-1}^0 \int_{-\sqrt{1-y^2}}^{\sqrt{1-y^2}} f(x,y)\,dxdy + \int_0^1 \int_{-\sqrt{1-y}}^{\sqrt{1-y}} f(x,y)\,dxdy$
(h) $\int_0^1 \int_{y^{1/2}}^{y^{1/3}} f(x,y)\,dxdy$ (i) $\int_{-1}^0 \int_{-2\arcsin y}^{\pi} f(x,y)\,dxdy + \int_0^1 \int_{\arcsin y}^{\pi - \arcsin y} f(x,y)\,dxdy$
(j) $\int_{-2}^0 \int_{2x+4}^{4-x^2} f(x,y)\,dydx$ (k) $\int_0^1 \int_x^{2-x} f(x,y)\,dydx$.

7. (a) $(-\frac{1}{2}, \frac{8}{5})$ (b) $(1,0)$ (c) $\left((\sqrt{2}+1)\left(\frac{\pi\sqrt{2}}{4} - 1\right), \frac{\sqrt{2}+1}{4}\right)$ (d) $(1/5, 1/5)$

8. O centro de massa encontra-se à distância de 2/3 dos lados AB e AD.

9. $\frac{1}{3}a(\sqrt{2} + \ln(1+\sqrt{2}))$