MAT2219 – Cálculo Diferencial e Integral III
Respostas de lista 2

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Primeira parte

1.
   a. 1
   b. $a = 1$, $b = 0$, $c = 2$, $d = 1$.

2.
   a. $x = u$, $y = u + 3v + uv$.
   b. O quadrado unitrio se transforma em um paralelogramo.

3.
   a. Paralelogramo.
   b. Esquinas $(1, 1)$, (e^2, e), (e^3, e^3), (e, e^2). Lados $x = y^2$, $y = x^2/e^3$, $x = y^2/e^3$, $y = x^2$.
   c. Esquinas $(0, 0)$, $(0, -1)$, $(1, 0)$, $(0, 1)$. Lados $x = 0$, $y = x^2 - 1$, $y = 1 - x^2$, $x = 0$.
   d. Esquinas $(0, 0)$, $(1, 0)$, $(1, 2)$, $(0, 1)$. Lados $y = 0$, $x = 1$, $y = 1 + x^2$, $x = 0$.
   e. $\{(x, y) : 0 \leq x^2 + y^2 \leq 1\}$.

4.
   a. 3
   b. 4/3
   c. $\frac{1}{3}(e^6 - 2e^3 + 1)$

5. Vrtices: $(0, 0)$, $(1, 0)$, $(1, f(1))$, $(0, f(0))$. $(1/2, 1)$ corresponde com $(1/2, f(1/2))$.
6. $\int_0^{\pi/4}(e^{-1/sin^2\theta} - 1)d\theta$.
7. $R = \{(r, \theta) : 0 \leq \theta \leq \pi/2; 0 \leq r \leq 1/cos\theta\}$. Integral=$\infty$
8. $\pi/2$.
9. $1/4(cos^2\alpha - sin^2\alpha)$.

Segunda parte

1.

a. $\int_0^{2\pi} \int_0^a f(rcos\theta, rsin\theta) r dr\, d\theta$

b. $\int_{-\pi/2}^{\pi/2} \int_0^{2cos\theta} f(rcos\theta, rsin\theta) r dr\, d\theta$

c. $\int_0^{2\pi} \int_a^b f(rcos\theta, rsin\theta) r dr\, d\theta.$

2.

a. $3\pi a^4/4$

b. $\frac{1}{6}a^3(\sqrt{2} + ln(\sqrt{2}+1))$

3. $\pi^4/3$.

4.

a. $4(u^2 + v^2)$

b. ..

c. 0