

MAT0211-45 - Cálculo III
Respostas da Lista de Exercícios 7

1. (a) -4 .
(b) 4 .
(c) 8 .
(d) 4π .
(e) $3\pi/2$.
2. π/a .
3. 0 .
4. (a) $\int_0^{2\pi} \int_0^a f(r \cos \theta, r \sin \theta) r \, dr \, d\theta$.
(b) $\int_{-\pi/2}^{\pi/2} \int_0^{2 \cos \theta} f(r \cos \theta, r \sin \theta) r \, dr \, d\theta$.
(c) $\int_0^{2\pi} \int_a^b f(r \cos \theta, r \sin \theta) r \, dr \, d\theta$.
(d) $\int_0^{\pi/2} \int_0^{1/(\sin \theta + \cos \theta)} f(r \cos \theta, r \sin \theta) r \, dr \, d\theta$.
(e) $\int_0^{\pi/4} \int_0^{\sin \theta / \cos^2 \theta} f(r \cos \theta, r \sin \theta) r \, dr \, d\theta$
 $+ \int_{\pi/4}^{3\pi/4} \int_0^{1/\sin \theta} f(r \cos \theta, r \sin \theta) r \, dr \, d\theta$
 $+ \int_{3\pi/4}^{\pi} \int_0^{\sin \theta / \cos^2 \theta} f(r \cos \theta, r \sin \theta) r \, dr \, d\theta$.
5. (a) $3\pi a^4/4$.
(b) $(a^3/6)[\sqrt{2} + \log(3 + 2\sqrt{2})]$.
(c) $\sqrt{2} - 1$.
(d) $\pi a^4/8$.
6. $\pi^4/3$.
7. (a) $1 + 2u$.

(b) -

(c) $14/3$.

(d) $2 - \frac{2}{\sqrt{3}} \operatorname{arctg} \left(\frac{5}{\sqrt{3}} \right) + \frac{2}{\sqrt{3}} \operatorname{arctg} \left(\frac{1}{\sqrt{3}} \right)$.

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

(b) -

(c) 0.

9. Basta fazer a mudança de variáveis correspondente a $u = x + y$, e $v = x - y$.