

MAT0211-45 - Cálculo III  
Respostas da Lista de Exercícios 9

1.  $4\pi/3$ .
2.  $1/2$ .
3.  $\pi\sqrt{2}$ .
4.  $(R/4)(1 - \cos \alpha)/(1 - \cos(\alpha/2))$ .
5.  $2\pi/3$ .
6.  $2\pi/3$ .
7. (a) 0.  
(b)  $-\pi$ .  
(c)  $-4$ .
8. -
9. (a)  $\text{rot } \vec{F} = (0, 0, 0)$  e  $\text{div } \vec{F} = 2x + 2y + 2z$ .  
(b)  $\text{rot } \vec{F} = (2, 4, 6)$  e  $\text{div } \vec{F} = 0$ .  
(c)  $\text{rot } \vec{F} = (1, 1, 0)$  e  $\text{div } \vec{F} = -x \text{ sen } y$ .
10.  $\text{div}(x, y, z) = 3 \neq 0$  e  $\text{div}(\text{rot } \vec{F}) = 0$  para todo campo  $\vec{F}$  de classe  $C^2$ .
11. -
12. 3.
13.  $8\pi/3$ .
14. 39.
15. -