

## Cálculo Diferencial e Integral 2

### Respostas à Ficha de Trabalho 7

1. a)  $\frac{1}{2}$ .  
 b)  $1 - \cos(2)$ .  
 c)  $e - 2$ .
2. a)  $\frac{\text{sen} 4}{4}$ .  
 b)  $\frac{1}{3}$ .
3. a)  $\int_{-1}^0 \left( \int_0^{\sqrt{1+y}} f(x, y) dx \right) dy + \int_0^1 \left( \int_0^{\sqrt{1-y^2}} f(x, y) dx \right) dy$ .  
 b)  $\int_0^1 \left( \int_{\sqrt{1-y^2}}^1 f(x, y) dx \right) dy + \int_1^2 \left( \int_0^{2-y} f(x, y) dx \right) dy$ .  
 c)  $\int_0^1 \left( \int_{y-2}^{-\sqrt{1-y^2}} f(x, y) dx + \int_{\sqrt{1-y^2}}^1 f(x, y) dx \right) dy + \int_1^2 \left( \int_{y-2}^{2-y} f(x, y) dx \right) dy$ .
4. A área é  $\frac{5}{3}$ . A coordenada  $x$  do centróide é  $\frac{7}{20}$ .
5. a)  $\int_0^1 \left( \int_0^{1-y} \left( \int_0^{x+y} dz \right) dx \right) dy$ , e  
 $\int_0^1 \left( \int_0^z \left( \int_{z-x}^{1-x} dy \right) dx + \int_z^1 \left( \int_0^{1-x} dy \right) dx \right) dz$ .  
 b)  $\int_{-1}^1 \left( \int_{-\sqrt{1-y^2}}^{\sqrt{1-y^2}} \left( \int_{-\sqrt{1-y^2}}^{\sqrt{1-y^2}} dz \right) dx \right) dy$  e  $\int_{-1}^1 \left( \int_{-\sqrt{1-x^2}}^{\sqrt{1-x^2}} \left( \int_{-\sqrt{1-y^2}}^{\sqrt{1-y^2}} dz \right) dy \right) dx$ .  
 c)  $\int_0^{\frac{1}{2}} \left( \int_0^y \left( \int_y^{2y} dx \right) dz + \int_y^{2y} \left( \int_z^{2y} dx \right) dz \right) dy + \int_{\frac{1}{2}}^1 \left( \int_0^y \left( \int_y^1 dx \right) dz + \int_y^1 \left( \int_z^1 dx \right) dz \right) dy$ ,  
 e  
 $\int_0^{\frac{1}{2}} \left( \int_{\frac{z}{2}}^z \left( \int_z^{2y} dx \right) dy + \int_z^{\frac{1}{2}} \left( \int_y^{2y} dx \right) dy + \int_{\frac{1}{2}}^1 \left( \int_y^1 dx \right) dy \right) dz +$   
 $\int_{\frac{1}{2}}^1 \left( \int_{\frac{z}{2}}^{\frac{1}{2}} \left( \int_z^{2y} dx \right) dy + \int_{\frac{1}{2}}^z \left( \int_z^1 dx \right) dy + \int_z^1 \left( \int_y^1 dx \right) dy \right) dz$ .
6. a) Pode ser  

$$\int_0^1 \left( \int_0^x \left( \int_{x/2}^x dy \right) dz \right) dx,$$
  
 b) Pode ser  

$$\int_0^1 \left( \int_{-\sqrt{\frac{1-z}{2}}}^{\sqrt{\frac{1-z}{2}}} \left( \int_{\sqrt{z+y^2}}^{\sqrt{1-y^2}} dx \right) dy \right) dz.$$

7.  $\frac{1}{6}$ .

8. a)  $\frac{7}{12}$ .

b)  $\log \sqrt{2} - \frac{5}{16}$ .

9. A primeira coordenada do centróide é  $\frac{4}{5}$ .