

Gabarito 3^a Lista - MAT 241 - Cálculo III - 2018/II

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- 1) (a) $\frac{1}{54}$ (e) $\frac{1}{2} - \frac{1}{2e^4}$ 19) $\frac{56}{3}\pi a^3$
 (b) 0 (f) $\frac{1 - \cos 1}{2}$ 20) $\frac{4a^3\pi(8 - 3\sqrt{3})}{3}$
 (c) $\frac{e}{2} + \frac{1}{2e}$ (g) $\sin 4 - 4 \cos 4$ 21) $\frac{\pi}{12}$
 (d) $\frac{26}{9}$ (h) $1 - \cos 1$ 22) (a) $\frac{e^2 - e + 1}{2}$ (c) $\ln 2 + \frac{1}{2}$
 2) (a) $\frac{1}{8}$ (c) $\frac{2}{3}$ (e) π (b) $\frac{5}{12}$ (d) $\frac{9}{4}$
 (b) $\frac{4}{3}\pi a^3$ (d) π 23) (a) $\frac{6}{35}$ (b) $\frac{31}{8}$
 3) (a) $\frac{9\pi^2}{16}$ (b) $\frac{2}{3}$ (c) 2π 24) (a) $\frac{e^9 - 1}{6}$ (b) $\frac{\ln 9}{3}$
 4) (a) $\frac{4\sqrt{2}\pi}{3}$ (b) $\frac{15}{16}$ 25) (a) 0 (b) $\frac{\pi \sin 9}{2}$ (c) $\frac{\pi(1 - e^{-4})}{2}$
 5) Demonstração. 26) (a) $\frac{\pi(1 - \cos 9)}{2}$ (b) $\frac{2\sqrt{2}}{3}$
 6) $\frac{4\pi a^3}{3}$ 27) (a) 1 (b) $-\frac{2}{15}$
 7) $k = 2\sqrt{4 - 2\sqrt[3]{2}}$ 28) Demonstração.
 8) $\frac{4\pi abc}{3}$ 29) $\frac{e}{2} - 1$
 9) (a) $\frac{32(2\sqrt{2} - 1)}{9}$ (b) $3(\cos 1 - \cos 4)$ 30) $\ln 2$
 10) R é uma elipse, S é um círculo de raio 1 e $\frac{\partial(x,y)}{\partial(u,v)} = ab$. 31) $8\left(\sqrt{e} - \frac{1}{e}\right)$
 11) 117π 32) $\frac{\pi}{3}(27 - 5\sqrt{5})$
 12) $\frac{1}{10}$ 33) 648
 13) $\frac{4a^3}{3}$ 34) $\frac{1}{8}$
 14) A circunferência $x^2 + y^2 = a^2$ é levada na elipse

$$\frac{16u^2}{a^2} + \frac{v^2}{a^2} = 1.$$

 15) A reta $x = c$ é levada na circunferência $u^2 + v^2 = e^{2c}$. 35) 36π
 16) $\frac{\pi}{8}$ 36) $\int_0^3 \int_0^{\frac{12-4z}{3}} \int_0^{\frac{12-3x-4z}{6}} dy dx dz$
 17) $\frac{3\sqrt{2}\pi}{2}$ 37) $\frac{\pi}{8}$
 18) $\frac{1}{3}$ 38) $\frac{1}{24}$
 39) $\frac{\pi a^3 h^2}{60}$
 40) $\frac{2187\pi}{2}$

$$41) \frac{16\pi(\sqrt{3}-1)}{3}$$

$$42) \text{ (a) } \frac{15\pi}{4}$$

$$43) \text{ (a) } \frac{16}{3}$$

$$44) \text{ (a) } z = r^2$$

$$45) 2\pi$$

$$46) \frac{65}{4}\pi$$

$$\text{ (b) } \frac{\pi}{8}$$

$$\text{ (b) } 4\pi$$

$$\text{ (b) } r = 2 \operatorname{sen} \theta$$

$$\text{ (c) } \frac{7\pi}{4}$$

$$\text{ (c) } \frac{8}{15}$$

$$47) \frac{8}{3}\pi$$

$$48) \text{ (a) } \cos^2 \varphi = \operatorname{sen}^2 \varphi$$

$$\text{ (b) } \rho^2(\operatorname{sen}^2 \varphi \cos^2 \theta + \cos^2 \varphi) = 9$$

$$49) \text{ (a) } \frac{4\pi}{3}$$

$$\text{ (b) } \frac{(2-\sqrt{2})\pi}{3}$$

$$50) \text{ (a) } \frac{312000\pi}{7}$$

$$\text{ (b) } \frac{15\pi}{16}$$

$$\text{ (c) } \frac{1562\pi}{15}$$