INSTITUTO FEDERAL DE EDUCAÇÃO, CIÊNCIA E TECNOLOGIA
SUL-RIO-GRANDENSE
Campus Passo Fundo

Engenharia Civil e Engenharia Mecânica

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Exercícios

1) Calcular as integrais iteradas

a) $\int_0^1 \int_0^2 (x+3)\,dy\,dx$

b) $\int_1^3 \int_{-1}^1 (x^2-4y)\,dy\,dx$

c) $\int_2^4 \int_0^1 (x^2 y)\,dx\,dy$

d) $\int_{-2}^0 \int_{-1}^2 (x^2+y^2)\,dx\,dy$

e) $\int_0^{\ln 3} \int_0^{\ln 2} (e^{x+y})\,dy\,dx$

f) $\int_0^2 \int_0^1 (y sen(x))\,dy\,dx$

g) $\int_{-1}^0 \int_2^5 dx\,dy$

h) $\int_4^6 \int_{-3}^7 dy\,dx$

i) $\int_0^1 \int_0^1 \frac{x}{(xy+1)^2}\,dy\,dx$

j) $\int_{\frac{\pi}{2}}^{\pi} \int_1^2 (x\cos(xy))\,dy\,dx$

k) $\int_0^{\ln 2} \int_0^1 (xye^{y^2 x})\,dy\,dx$

l) $\int_3^4 \int_1^2 \frac{1}{(x+y)^2}\,dy\,dx$

2) Nos exercícios abaixo, calcular as integrais duplas na região retangular R:

a) $\iint_R 4xy^3 dA$ $\quad R=\{(x,y): -1\le x\le 1,\ -2\le y\le 2\}$

b) $\iint_R \frac{xy}{\sqrt{x^2+y^2+1}}\,dA$ $\quad R=\{(x,y): 0\le x\le 1,\ 0\le y\le 1\}$

c) $\iint_R x\sqrt{1-x^2}\,dA$ $\quad R=\{(x,y): 0\le x\le 1,\ 2\le y\le 3\}$

d) $\iint_R (xseny - senx)dA$ $\quad R=\{(x,y): 0\le x\le \frac{\pi}{2},\ 0\le y\le \frac{\pi}{3}\}$

Respostas:

1) a) 7 b) 52/3 c) 2 d) 14 e) 2

f) $\cong 0{,}01$ *ou* $-\frac{\cos(2)}{2}+\frac{1}{2}$ g) 3 h) 20 i) $\cong 0{,}30$

j) -2 k) $-\frac{\ln(2)+1}{2}$ l) $-\ln(6)+2\ln(5)-\ln(4)$

2) a) 0 b) $\sqrt{3}-\frac{4\sqrt{2}}{3}+\frac{1}{3}$ c) 1/3 d) $-\frac{\pi}{3}+\frac{\pi^2}{16}$