Polytechnique Montréal Département de Mathématiques et de Génie Industriel

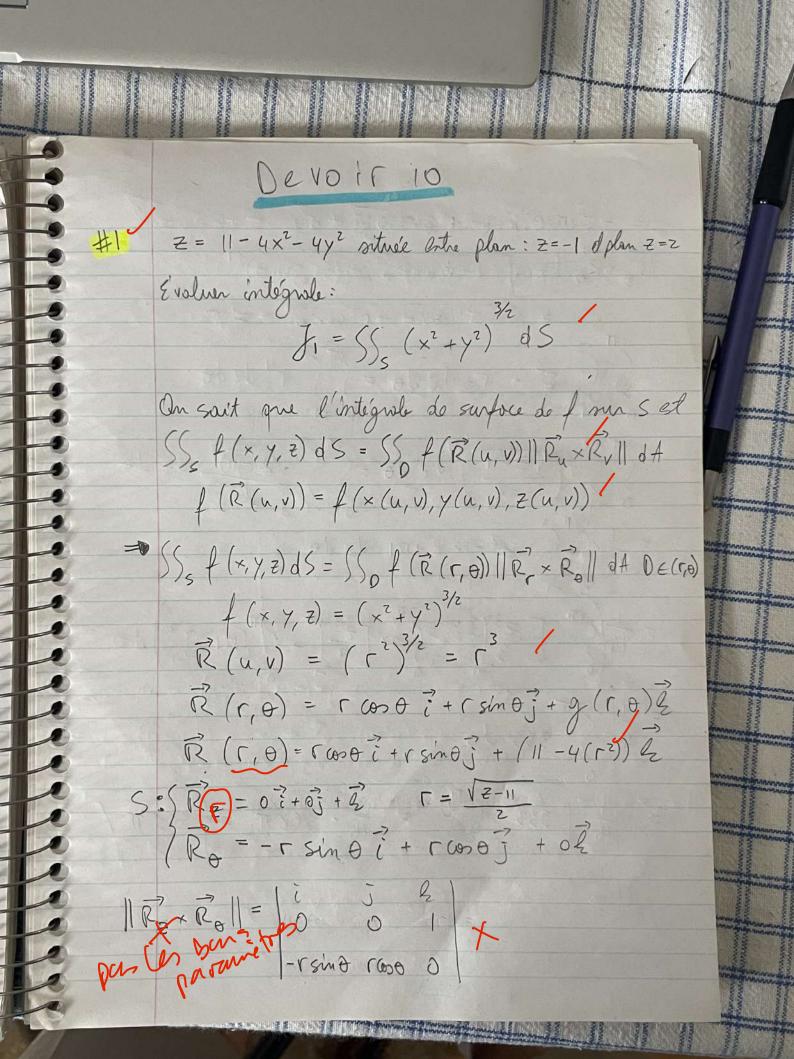
MTH1102D - Calcul II

Été 2023

Devoir 10

Nom :	Prénom :
Matricule :	Groupe :

Question	Autres	
corrigée	questions	Total
45	4	/10

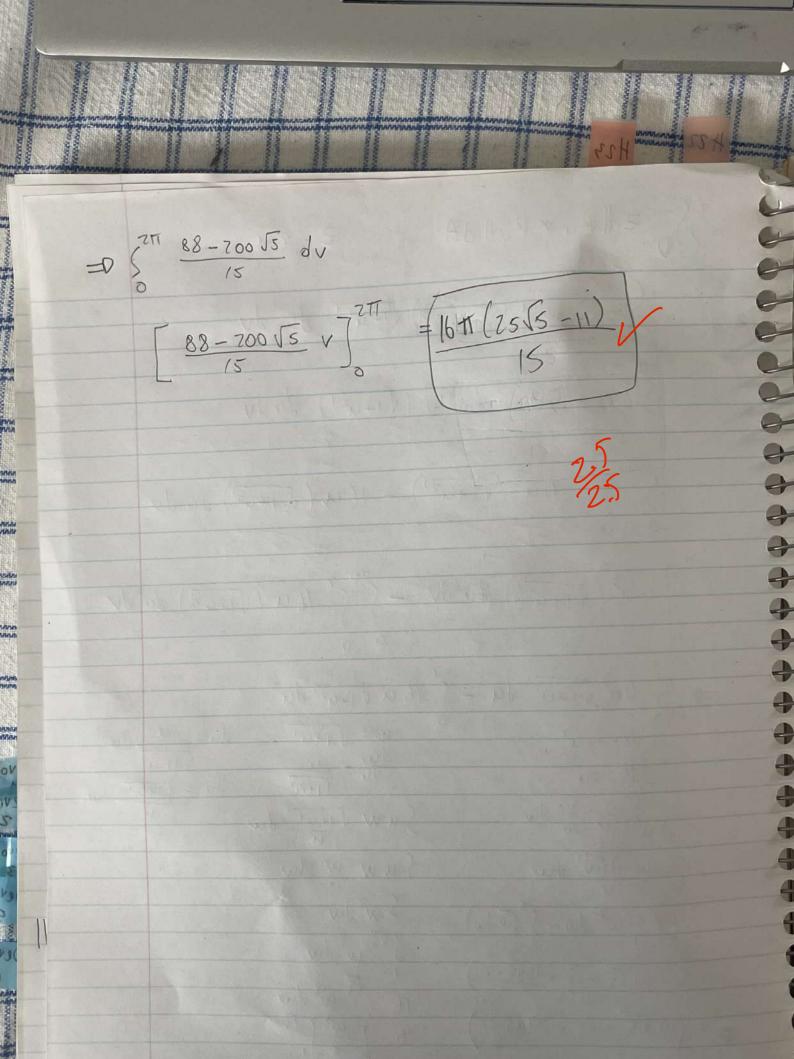


= - r con 0 = - r sin 0 = + 0] = \ \(\chi^2 \cos^2 \tau + \chi^2 \sim^2 \tau' = \chi S (13 . r. dzdo = 5 1 / dzdo $\int_{0}^{2\pi} \int_{0}^{2\pi} \left(\sqrt{\frac{2}{11}} \right)^{4} dz d\theta = \int_{0}^{2\pi} \int_{0}^{2\pi} \left(\frac{2}{2} - 11 \right)^{2} dz d\theta$ = 1 (2²-22 2+12| dz do ... $= \frac{1}{16} \left(\frac{217}{3} \left[\frac{23}{3} \right]^{2} + \left\{ 22 \left[\frac{27}{2} \right]^{2} + \left[12 \right]^{2} \right\} d\theta$ $= \frac{1}{16} \int_{333}^{2\pi} d\theta$ $= \frac{1}{16} \left[\frac{333}{3} \frac{1}{6} \right]^{277} = \frac{1}{16} \cdot \frac{666}{666} \pi = \boxed{\frac{333}{3}} \pi$

x2+y2= 12 Ropel x= r con o y=rsino =-15252 MM (100) $\frac{2}{-9} = \frac{11 - 4x^2 - 4y^2}{-9}$ $-1 = 11 - 4x^2 - 4y^2$ $-17 = -4(x^{2}+y^{2})^{2}$ $3 = x^{2}+y^{2}$ $3 = (^{2}$ r=13 3 4 5 5 5 0 0 5 0 5 0 5 7 1 1300 V 102 + 180 V 3 (80) -1

Surface représentée et parametrée par : R(u,v)=(4-u2)cos(v)i+(4-u2)sin(v)j + zu & $(u,v) \in [0,2] \times [0,277]$ Quiente point (3,0,2) par n = 1/2 (i+2) 0) Jr = SS = dS. Ry = (u2-4) min vi + (4-u2) cos v j Ru = - Zu cos v i - zu smv j + zk RuxRv = | i j Rz -zucos(v) -zusm(v) z (u2-4) sho (4-42) 600 0 = -2 (4-u2) cos v i + 2 (u2-4) sinv j+ (-24 (-u2+4) (cos (v)+ sin (v)) & = $-2(4-u^2)$ ($\omega v_i^2 + 2(u^2-4)$ shoy $\frac{1}{2} + (-2u(-u^2+4))$ $\frac{1}{2}$ $\frac{1}{2$ || RuxRv || = ((2u2-8)cosv)2+((2u2-8)sinv)2+(u (2u2-8))2 2 = \ \ \(\langle \tau^2 - 8\rangle^2 \left(\text{cov} \rangle^2 + \left(\text{zu}^2 - 8\rangle^2 \right)^2 + \left(\text{u}^2 - 8\rangle^2 \right)^2 \) 2 = \ (zu2-8)2 (co3v + sin2v + y2) 6 = V (242-8)2 (1+42) = (2 u2-8) ((1+uz))

SSO ZIRuxRvIIdA Z=Zu 5. 5 zu (zu2-8)(1+42) du du = 5 (4 u3 - 16 u) (TI+u21) dudu = 5 5 443 (TI+u2) - 164 (JI+u2) du du 35 4 43 (\(\tau \) du dv - \(\frac{7}{5}\) du dv \(-\frac{7}{5}\) \(\frac{1}{5}\) du dv $W = 1 + u^{2}$ $\frac{dW}{du} = 7u$ $\int u^{2} = 7u$ $\int u^{2} = \sqrt{1 + u^{2}}$ $\int u^{2} = \sqrt{1 + u^{2}$ 455 (W-1) W dw Suw w dw > ms gm 4. 2 (5 w dw - 5 (mdw) Zrz ms 9m 4. - 2 (10 15 - 3 - 10 15 - 2) 16 5, w dw 2 (1015-25-1015-2) 19 [3] 12 D 16 (5√5-1) $= 2(10\sqrt{5} - \frac{2}{5} - 10\sqrt{5} - 2) - \frac{16(5\sqrt{5} - 1)}{3} = 88 - 700\sqrt{5}$



b)
$$\int_{3}^{2} = \left(\sqrt{\frac{1}{5}} \cdot \sqrt{\frac{1}{5}} \right)^{2} = \sqrt{\frac{1}{5}} \cdot \sqrt{\frac{1}{5}} + 2^{2} \frac{1}{2^{2}} = \frac{1}{5} \cdot \sqrt{\frac{1}{5}} \cdot \sqrt{\frac{1}{5}} = \frac{1}{5} \cdot \sqrt{\frac{1}{5}} \cdot \sqrt{\frac{1}{5}} + 2^{2} \frac{1}{2^{2}} = \frac{1}{5} \cdot \sqrt{\frac{1}{5}} \cdot \sqrt{\frac{1}{5}} + 2^{2} \frac{1}{2^{2}} +$$