“QUIZ” for Lecture 15

NAME: (print!) Yongshan Li **Section:**23

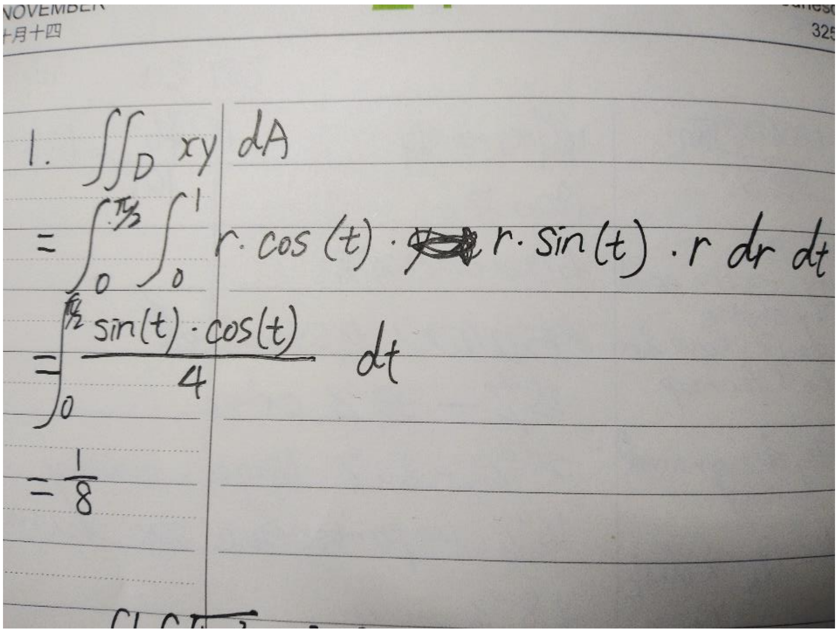
E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: qXFirstLast.pdf) ASAP BUT NO LATER THAN Oct. 29, 8:00pm

1. Use polar coordinates to compute the double integral

Z Z D xy dA ,

where

D = {(x, y)| x^2 + y^2 ⩽ 1 , x ⩾ 0 , y ⩾ 0 } .



1. $\iint_D xy\, dA$

$= \int_0^{\pi/2}\int_0^1 r\cdot\cos(t)\cdot r\cdot\sin(t)\cdot r\, dr\, dt$

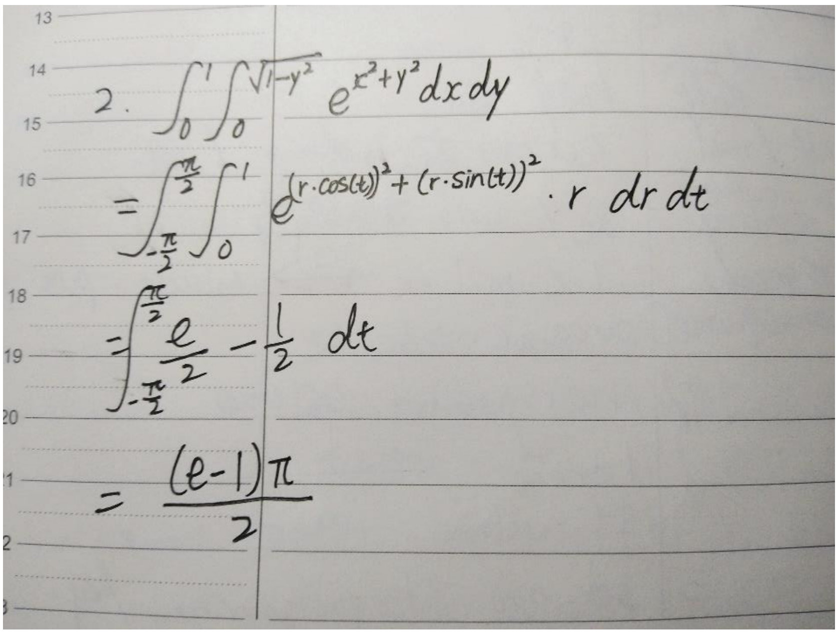
$= \int_0^{\pi/2} \frac{\sin(t)\cdot\cos(t)}{4}\, dt$

$= \frac{1}{8}$

2. Evaluate the iterated integral by converting it to polar coordinates

Z 0->1 Z 0-> √ (1−y^2)e^(x^2+y^2)dx dy .

Note: The previous version had a typo (dy dx instead of dx dy, that made it nonsense). I thank Yidi ”Wendy” Weng for pointing it out (and see won a dolllar).



2. $\int_0^1\int_0^{\sqrt{1-y^2}} e^{x^2+y^2}\, dx\, dy$

$= \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}}\int_0^1 e^{(r\cdot\cos(t))^2+(r\cdot\sin(t))^2}\cdot r\, dr\, dt$

$= \int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \frac{e}{2} - \frac{1}{2}\, dt$

$= \frac{(e-1)\pi}{2}$