"QUIZ" for Lecture 23

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E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: qXFirstLast.pdf) ASAP BUT NO LATER THAN Dec. 1, 2020, 8:00pm

1. Determine whether or not the vector field is conservative. If it is, find a function f such that $\mathbf{F} = \bigtriangledown f$.

$$\mathbf{F}(x,y,z) = (3x^2y^3z^3 + yz)\,\mathbf{i} + (3x^3y^2z^3 + xz)\,\mathbf{j} + (3x^3y^3z^2 + xy)\,\mathbf{k}$$

$\int 3x^2y^3z^3 + yz\,dx = x^3y^3z^3 + xyz + g(y,z)$ curl(F) = 0

$\int (3x^3y^2z^3 + xz)\,dy = x^3y^3z^3 + xyz + g(x,z)$ $g(y,z) = g(x,z) = g(x,y)$

$\int (3x^3y^3z^2 + xy)\,dz = x^3y^3z^3 + xyz\ g(x,y)$ $f = x^3y^3z^3 + xyz$

2. Evalute

$$\int_C 5y\,dx + 10x\,dy \quad ,$$

where C is the closed curve consisting of the boundary of the rectangle

$$\{\,(x,y)\,|\,0 \le x \le 1 \quad , \quad 0 \le y \le 1\,\}.$$