"QUIZ" for Lecture 23

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NAME: (print!) _____   **Section:** $\underline{\text{All}}$

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 $\mathbf{F} = \bigtriangledown f$.

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

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i                  j                k
d/dx              d/dy             d/dz
3x^2y^3z^3+yz   3x^3y^2z^3+xz   3x^3y^3z^2+xy
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i(d/dy(3x^3y^3z^2+xy)-d/dz(3x^3y^2z^3+xz))-j(d/dx(3x^3y^3z^2+xy)-d/dz(3x^2y^3z^3+yz))+k(d/dx(3x^3y^2z^3+xz)-d/dy(3x^2y^3z^3+yz))=0
fx=3x^2y^3z^3+yz
f=x^3y^3z^3+xyz+g(y,z)
fy= 3x^3y^2z^3+xz
3x^3y^2z^3+xz+gy=3x^3y^2z^3+xz
gy=0 g(y,z)=h(z)
f=x^3y^3z^3+xyz+h(z)
fz=3x^3y^3z^2+xy
3x^3y^3z^2+xy+h'z=3x^3y^3z^2+xy
h'z=0
h(z)=0
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

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

P=5y Q=10x
dQ/dx-dP/dy=10-5=5
intint5dA
intint5dxdy x=0..1 y=0..1
=5