

“QUIZ” for Lecture 19

NAME: (print!) _____ Section: _____

E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q19FirstLast.pdf) ASAP BUT NO LATER THAN Nov. 12, 8:00pm

1.

Determine whether or not the vector field

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

is conservative. If it is conservative, find a function f such that $\mathbf{F} = \nabla f$.

$$\frac{\partial f}{\partial y} = yz^3 \quad \frac{\partial a}{\partial x} = 2yz^3$$

$$\frac{\partial a}{\partial z} = 6xyz^2 \quad \frac{\partial b}{\partial y} = 6xyz^2$$

$$\frac{\partial b}{\partial x} = 3y^2 z^2 \quad \frac{\partial c}{\partial z} = 3y^2 z^2$$

Conservative

2. Show that the line integral

$$\int_C 2xy^2 dx + 2x^2y dy \quad ,$$

is independent of the path C , and evaluate it if C is any path from $(1, 0)$ to $(0, 1)$.

$$f = 2xy^2 \mathbf{i} + 2x^2y \mathbf{j}$$

$$\int p dx = \int 2xy^2 dx = x^2y^2 + g(y)$$

$$f_y = \int x^2y^2 + g(y) dy$$