

"QUIZ" for Lecture 18

NAME: (print!) Krithika Patrachari Section: 22

E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q18FirstLast.pdf) ASAP BUT NO LATER THAN Nov. 9, 8:00pm

1. Let C be the line segment from $(0, 1)$ to $(2, 3)$, find $\int_C xy \, ds$.

$$AB \rightarrow A + t(B-A) \rightarrow (0, 1) + t(2, 2) = (2t, 1+2t)$$

$$\begin{aligned} x(t) &= 2t & y(t) &= 1+2t & ds &= \sqrt{4+4} = \sqrt{8} \\ x'(t) &= 2 & y'(t) &= 2 \end{aligned}$$

$$\int_0^1 2t(1+2t)(\sqrt{8}) \, dt \rightarrow \int_0^1 2\sqrt{8}t + 4\sqrt{8}t^2 \, dt$$

$$= \sqrt{8}t^2 + \frac{4\sqrt{8}}{3}t^3 \Big|_0^1 = \sqrt{8} + \frac{4\sqrt{8}}{3} = \frac{7\sqrt{8}}{3}$$

2. Evaluate

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

where C is $x = t^2, y = t^3, 0 \leq t \leq 1$.

$$dx = 2t \quad dy = 3t^2$$

$$\int_0^1 (t^2)(t^3)^2(2t) + (t^2)^2(t^3)(3t^2) \, dt$$

$$= \int_0^1 2t^9 + 3t^9 \, dt = \int_0^1 5t^9 \, dt$$

$$\frac{1}{2}t^{10} \Big|_0^1 = \frac{1}{2}$$