

"QUIZ" for Lecture 18

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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  $\int_C xy \, ds$ .

$$\vec{r}(t) = \langle 0, 1 \rangle + t \langle 2, 3 \rangle = \langle 0 + 2t, 3t + 1 \rangle; \quad x = 2t \quad y = 3t + 1$$
$$|\vec{r}(t)| = \sqrt{(2t)^2 + (3t + 1)^2} = \sqrt{4t^2 + 9t^2 + 6t + 1} = \sqrt{13t^2 + 6t + 1} \, dt$$

$$\int_C xy \, ds = \int_C (2t)(3t + 1) \sqrt{13t^2 + 6t + 1} \, dt$$

2. Evaluate

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

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

$$\int_0^1 t^2 t^6 (2t \, dt) + t^4 t^3 (3t^2 \, dt)$$

$$\int_0^1 (2t^9 + 3t^9) \, dt = \int_0^1 5t^9 \, dt = \left. \frac{5t^{10}}{10} \right|_0^1 = \frac{1}{2}$$