

"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  $\int_C xy \, ds$ .

$$\vec{v} = \langle 0, 1 \rangle + t \langle 2, 2 \rangle \quad x(t) = 2t \quad y(t) = 1 + 2t \quad 0 \leq t \leq 1$$
$$x'(t) = 2 \quad y'(t) = 2 \quad \sqrt{x'(t)^2 + y'(t)^2} = 2$$

$$\int_0^1 2t \cdot (1+2t) \cdot 2 \, dt = 4 \int_0^1 t + 2t^2 \, dt$$
$$= 4 \left( \frac{t^2}{2} + \frac{2t^3}{3} \right) \Big|_0^1 = \boxed{\frac{14}{3}}$$

2. Evaluate

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

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

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

$$= \left( \frac{t^{10}}{5} + \frac{3t^{10}}{10} \right) \Big|_0^1 = \boxed{\frac{1}{2}}$$