

Quiz for lecture 18

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Section: 23

1. Let C be the line segment from $(0,1)$ to $(2,3)$.

find $\int_C xy \, ds$.

$$x=2t \quad dx=2dt$$

$$y=2t+1. \quad dy=2dt$$

$$\int_0^1 4 \, dt = 4x|_0^1 = 4$$

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

$$= 2\sqrt{2} \left[\frac{4}{3}t^3 + t^2 \right]_0^1$$

$$= \frac{14}{3}\sqrt{2}$$

2. Evaluate $\int_C x^2 y \, dx + x^2 y \, dy$

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

$$dx=2t \, dt$$

$$dy=3t^2 \, dt$$

$$\int_0^1 t^6 \cdot 2t \, dt + t^7 \cdot 3t^2 \, dt$$

$$= 5 \int_0^1 t^9 \, dt$$

$$= 5 \times \left[\frac{t^{10}}{10} \right]_0^1$$

$$= 5 \times \frac{1}{10}$$

$$= \frac{1}{2}$$

