SCHOOL OF MATHEMATICS AND PHYSICS

Line integral of a scalar function

Evaluate the line integral, where C is the given curve.

1. $f(x, y) = y^3$, where $C : x = t^3, y = t$, $0 \leq t \leq 2$.
2. $f(x, y) = xy$, where $C : x = t^2, y = 2t$, $0 \leq t \leq 1$.
3. $f(x, y) = xy^4$, where C is the right half of the circle $x^2 + y^2 = 16$.
4. $f(x, y) = x \sin y$, where C is the line segment from $(0, 3)$ to $(4, 6)$.
5. $f(x, y) = e^{\frac{1}{2}x-1}$, where $C : x = t, y = \cos 2t$, $0 \leq t \leq 2\pi$.

Use the online simulation from the SciMS website to help you visualise the line integral for each case. Click on the link below:

https://teaching.smp.uq.edu.au/scims/Adv_calculus/Int_scalar_function.html