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MA 510
Spring 2020

Homework 11

Due April 22nd by 12:30pm by email to kdatchev@purdue.edu. Justify your answers. Please let me know if you have a question or find a mistake.

1. Find
$$\int_C (x+y)dx + e^y dy + \ln(1+z)dz,$$
where C is the rectangle from $(1,2,3)$ to $(2,3,4)$ to $(3,4,2)$ to $(2,3,1)$ and back to $(1,2,3)$.

2. Let
$$F = (x + y^a z^3, \sin y + bxyz^3, e^z + cxy^2 z^d),$$
where a, b, c, and d are real numbers.
   (a) For which values of a, b, c, and d is there a function f such that $\nabla f = F$?
   (b) For the values of a, b, c, and d you found in part (a) above, evaluate $\int_C F \cdot ds$, where C is the curve
$$\sin x + xyz = x^2 - y + z - 1 = e^{xyz} - e^x,$$
   from the point where it intersects the y axis to the point where it intersects the z axis.