

Homework 9

Due March 30th in class or by 3:20 pm in MATH 602.

1. Do problem 1 from page 16 of <https://www.math.purdue.edu/~dvb/preprints/diffforms.pdf>
2. Do problem 2 from page 16 of <https://www.math.purdue.edu/~dvb/preprints/diffforms.pdf>

3. Evaluate

$$\int_C \sin z dx + \cos(\sqrt{y}) dy + x^3 dz,$$

where C is the line segment from $(1, 0, 0)$ to $(0, 0, 3)$.

4. Which of the following one forms can be written as df for some function $f: \mathbb{R}^3 \rightarrow \mathbb{R}$? If the answer is yes, find such a function f .
 - (a) $ydx + xdy + \sin z dz$,
 - (b) $ydx - xdy + \sin z dz$.

5. (a) Find a function f such that

$$df = yzdx + xzdy + xydz.$$

- (b) Evaluate

$$\int_C yzdx + xzdy + xydz,$$

where C is the parametric curve $(\cos t, e^t, \ln t)$, $1 \leq t \leq 2$.