

# MATH 13, FALL '16

## HOMEWORK 7

Due **Tuesday**, Nov 1, **before X-hour**

**NO LATE ASSIGNMENTS ACCEPTED**

Write your answers neatly and clearly. Use complete sentences, and label any diagrams. List problems in numerical order and staple all pages together. Start each problem on a new page. Please show your work; no credit is given for solutions without work or justification.

Remember that you may discuss the problems with classmates, but all work should be your own. List the names of anybody with whom you discussed the problems at the top of the page.

1. Use a change of coordinates to calculate  $\iint_R (x+y)e^{x^2-y^2} dA$  where the region  $R$  is the parallelogram defined by  $0 \leq x-y \leq 2$  and  $0 \leq x+y \leq 3$ . (*Hint*: Recall that  $x^2 - y^2 = (x+y)(x-y)$ .)
2. Compute  $\int_C \mathbf{F} \cdot d\mathbf{r}$  where  $\mathbf{F} = \langle \tan(y), x \sec^2(y) \rangle$  and  $C$  is any path from  $(1,0)$  to  $(2, \pi/4)$ . (*Hint*: The derivative of  $\tan(y)$  is  $\sec^2(y)$ .)
3. Compute  $\int_C xy^2 ds$  where  $C$  is the right half of the circle  $x^2 + y^2 = 16$ .
4. Use Green's Theorem to compute the **flux** of the vector field  $\mathbf{F} = \langle x^2y^2, 4xy^3 \rangle$  out of the triangular region with vertices  $(0,0)$ ,  $(1,3)$ , and  $(0,3)$ .