

The last homework ☹️

SHOW ALL WORK FOR FULL CREDIT — PLEASE CIRCLE FINAL ANSWER

DUE: TUESDAY, APRIL 25, 2006 AT THE BEGINNING OF CLASS

1. (5 pts) Evaluate $\iint_R (x^2 - xy + y^2) dA$, where R is the region bounded by the ellipse $x^2 - xy + y^2 = 2$ using the transformations $x = \sqrt{2}u - \sqrt{2/3}v$, $y = \sqrt{2}u + \sqrt{2/3}v$.

2. (5 pts each) Evaluate the integral by making an appropriate change of variables:
 - (a) $\iint_R (x+y)e^{x^2-y^2} dA$, where R is the rectangle enclosed by the lines $x-y=0$, $x-y=2$, $x+y=0$, and $x+y=3$.

 - (b) $\iint_R \sin(9x^2 + 4y^2) dA$, where R is the region in the first quadrant bounded by the ellipse $9x^2 + 4y^2 = 1$.

 - (c) $\iint_R (x+y)^2 \sin^2(x-y) dA$, where R is the region bounded by the square with vertices $(0,1)$, $(1,2)$, $(2,1)$, and $(1,0)$.

3. (4 pts) Evaluate the line integral $\int_C (2x+9z) ds$ where C is given by $x=t$, $y=t^2$, $z=t^3$; $0 \leq t \leq 1$.