Math 128, Spring 2005
Section A, Quiz 6

Name: Solutions

Show all work clearly and in order, and circle your final answers. Justify your answers algebraically whenever possible. Please write down all relevant mathematics. You have 20 minutes.

1. PROBLEM ONE

Evaluate $\int_0^1 xe^{xy}dy$.

$u = xy$
$du = x\,dy$

$= \int_{y=0}^{y=1} e^u\,du = e^{xy}\Big|_{y=0}^{y=1} = e^x - 1$

2. PROBLEM TWO

Evaluate $24\int_1^2\int_3^4(2x+y)^2dxdy$.

$= \frac{12}{3}\int_1^2 \left[(2x+y)^3\right]_{x=3}^{x=4} dy = 4\int_1^2 (8+y)^3 - (6+y)^3\,dy$

$= 4\left(\frac{(8+y)^4}{4} - \frac{(6+y)^4}{4}\right)\Big]_{y=1}^{2} = (8+y)^4 - (6+y)^4\Big|_1^2 = 10^4 - 8^4 - 9^4 + 7^4$

3. PROBLEM THREE

Use your calculator to find the straight line prediction equation of the form $y = ax + b$ which best fits (in the least squares sense) the 6 (x, y) data points $(1,1), (2,1), (3,2), (4,3), (5,3)$, and $(5,5)$. Write down the values of a, b, r^2, and r reported by your calculator.

$a = .825$

$b = -.25$

$r \approx .8883$

$r^2 \approx .789$

Math 128, Spring 2005
Section B, Quiz 6

Name: Solutions

Show all work clearly and in order, and circle your final answers. Justify your answers algebraically whenever possible. Please write down all relevant mathematics. You have 20 minutes.

1. PROBLEM ONE

Evaluate $\int_0^2 2ye^{2xy}dx$.

$u = 2xy$

$du = 2y\,dx$

$= \int_{x=0}^{2} e^u du = e^{2xy}\Big|_{x=0}^{x=2} = e^{4y} - 1$

2. PROBLEM TWO

Evaluate $12\int_1^2\int_2^3 (x+2y)^2 dxdy$.

$= \frac{12}{3}\int_{y=1}^{2}\left[(x+2y)^3\right]_{x=2}^{x=3} dy = 4\int_{y=1}^{2}(3+2y)^3 - (2+2y)^3\,dy$

$= \frac{4}{8}\left[(3+2y)^4 - (2+2y)^4\right]_{y=1}^{2}$

$= \frac{1}{2}\left[7^4 - 6^4 - 5^4 + 4^4\right]$

3. PROBLEM THREE

Use your calculator to find the straight line prediction equation of the form $y = ax + b$ which best fits (in the least squares sense) the 6 (x, y) data points $(0,0), (1,0), (2,1), (3,2), (4,2), (5,5)$. Write down the values of a, b, r^2 and r reported by your calculator.

$a \approx .914$

$b \approx -.619$

$r \approx .918$

$r^2 \approx .844$

Math 128, Spring 2005
Section C, Quiz 6

Name: Solutions

Show all work clearly and in order, and circle your final answers. Justify your answers algebraically whenever possible. Please write down all relevant mathematics. You have 20 minutes.

1. PROBLEM ONE

Evaluate $\int_0^2 4xe^{4xy}dy$. $= \int_{y=0}^{2} e^u du = e^{4xy}\Big|_{y=0}^{2} = e^{8x} - 1$

$u = 4xy$

$du = 4x\,dy$

2. PROBLEM TWO

Evaluate $6\int_1^2 \int_2^3 (x+y+1)^2 dx dy$. $= \frac{6}{3}\int_1^2 \left[(x+y+1)^3\right]_{x=2}^{3} dy = 2\int_1^2 (4+y)^3 - (3+y)^3 dy$

$= \frac{2}{4}\left((4+y)^4 - (3+y)^4\right)\Big|_{y=1}^{2} = \frac{1}{2}\left(6^4 - 5^4 - 5^4 + 4^4\right)$

3. PROBLEM THREE

Use your calculator to find the straight line prediction equation of the form $y = ax+b$ which best fits (in the least squares sense) the 6 (x, y) data points $(-1,-1), (0,-1), (1,0), (2,1), (3,1), (5,5)$. Write down the values of a, b, r^2 and r reported by your calculator.

$a \approx .971$

$b \approx -.7857$

$r \approx .941$

$r^2 \approx .88607$