

"QUIZ" for Lecture 12

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E-MAIL SCANNED .pdf OF COMPLETED QUIZ to DrZcalc3@gmail.com (Attachment: q12FirstLast.pdf) ASAP BUT NO LATER THAN Oct. 19 8:00pm

1. Calculate the iterated integral

$$\int_1^2 \int_{-1}^1 (x+y^2) dx dy$$

$$\int_{-1}^1 (x+y^2) dy = xy + \frac{y^3}{3} \Big|_{-1}^1 = (1x + \frac{1}{3}) - (-1x + \frac{-1}{3}) = 2x + \frac{2}{3}$$

$$\int_1^2 2x + \frac{2}{3} dx = \frac{2x^2}{2} + \frac{2}{3}x \Big|_1^2 = (2^2 + \frac{2}{3}(2)) - (1^2 + \frac{2}{3}(1)) = (\frac{16}{3} + \frac{4}{3}) - (\frac{3}{3} + \frac{2}{3}) = \frac{16}{3} - \frac{5}{3} = \frac{11}{3}$$

2. Calculate the double integral

$$\iint_R \frac{x^2 y}{x^3 + 1} dA$$

$$R = \{(x,y) | 0 \leq x \leq 1, -1 \leq y \leq 1\}$$

$$\int_0^1 \int_{-1}^1 \frac{x^2 y}{x^3 + 1} dx dy$$

$$\int_0^1 \frac{x^2 y}{x^3 + 1} dx = \int_0^1 x^2 y + \int_0^1 \frac{1}{x^3 + 1} = \frac{x^3 y}{3} \Big|_0^1 + \ln(x^3 + 1) \Big|_0^1 = \frac{y}{3} + \ln(2)$$

$$\int_{-1}^1 \frac{y}{3} + \ln(2) dy = \frac{y^2}{6} + y \ln(2) = (\frac{1}{6} + \ln(2)) - (\frac{1}{6} + \ln(2)) = 0 - 2 \ln(2) = -1.386$$