

MATH 2850 Sec 003
 ELEMENTARY MULTIVARIABLE CALCULUS
 QUIZ 4
 February 27, 2013

Name (Last, First) Key

1. Evaluate the iterated integral. Show your work.

$$\begin{aligned}
 \int_0^3 \int_{-2}^0 (x^2y - 2xy) dy dx &= \int_0^3 \left[\frac{x^2y^2}{2} - xy^2 \right]_{-2}^0 dx \\
 &= \int_0^3 [0 - (2x^2 - 4x)] dx \\
 &= 2x^2 - \frac{2x^3}{3} \Big|_0^3 \\
 &= 2 \cdot 9 - 2 \cdot 9 \\
 &= \boxed{0}
 \end{aligned}$$

2. Evaluate the double integral over the given region R .

$$\begin{aligned}
 \iint_R \left(\frac{\sqrt{x}}{y^2} \right) dA, \quad R: 0 \leq x \leq 4, 1 \leq y \leq 2 \\
 \int_0^4 \int_1^2 \frac{\sqrt{x}}{y^2} dy dx &= \int_0^4 \left[\frac{\sqrt{x}}{y} \right]_{y=1}^{y=2} dx \\
 &= \int_0^4 \left(\frac{\sqrt{x}}{2} - \sqrt{x} \right) dx \\
 &= \frac{2}{3} x^{3/2} - \frac{x^{3/2}}{3} \Big|_0^4 \\
 &= \frac{2}{3} 4^{3/2} - \frac{4^{3/2}}{3} \\
 &= \frac{16}{3} - \frac{8}{3} = \boxed{\frac{8}{3}}
 \end{aligned}$$