

Exam II Hints and Answers
Math 126 E Spring 2011 – Version Alpha

1. (a) $f_x(x, y) = \frac{-y^4}{2x^{3/2}} \cos\left(\frac{y^4}{\sqrt{x}}\right)$
(b) $f_y(x, y) = \frac{4y^3}{\sqrt{x}} \cos\left(\frac{y^4}{\sqrt{x}}\right)$
(c) $f_{yy}(x, y) = \frac{12y^2}{\sqrt{x}} \cos\left(\frac{y^4}{\sqrt{x}}\right) - \frac{16y^6}{x} \sin\left(\frac{y^4}{\sqrt{x}}\right)$
2. $\int_0^1 \int_0^{y^2} g(x, y) dx dy + \int_1^5 \int_0^{\frac{1}{4}(5-y)} g(x, y) dx dy$
3. HINT: Let $f(x, y) = \frac{x^2}{y^3 + 1}$ and find the equation of the tangent plane at $(4, 1)$.
ANSWER: $f(4.01, 0.99) \approx 8.16$
4. There is a local minimum at $(0, 0)$ and a saddle point at $(-\frac{1}{2}, 0)$.
5. $(0, \frac{6}{\pi})$