MAT3500-01/04 05F Quiz 7  Print Name (Last, First)

Show all work, including mental steps, in a clearly organized way that speaks for itself. Use proper mathematical notation, identifying expressions by their proper symbols (introducing them if necessary), and use arrows and equal signs when appropriate. Always simplify expressions. BOX final short answers. LABEL parts of problem. Keep answers EXACT (but give decimal approximations for interpretation). Indicate where technology is used and what type (Maple, GC).

1. \( f(x, y) = x^2 + 2y^2 - xy \).
   a) Write down an iterated double integral for the integral of this function over the rectangle \([0,2] \times [0,1]\) in the \(xy\)-plane and evaluate it by hand showing every step, using equal signs appropriately and doing linked side calculations if it clarifies your procedure.
   b) OPTIONAL. Does your hand result agree with Maple or your GC successive integrations?

2. \( g(x, y) = x^2 + 3xy + y^3 \).
   a) Show that \((0, 0)\) and \((-1, -1)\) are critical points of \(g\).
   b) Classify these critical points using the second derivative test, using words if necessary to clarify your supporting evidence.
   c) OPTIONAL. Does a 3d plot confirm your conclusions? Can you do that on a GC?

► solution