Exercise Sheet 11

1. For the functions of two variables given by the following formulas, find any points where both partial derivatives vanish. If possible, determine whether they are local maxima, local minima, or neither.

   (a) $f(x,y) = x^3 + 3xy + y^3$

   (b) $f(x,y) = x^4 + 2x^2y - x^2 + 3y^2$

2. Verify that the following differential equation is exact and find an implicit solution (of the form $h(x,y) = C$):
$$\frac{dy}{dx} = \frac{y - 3x^2e^y}{x^3e^y - x}$$

Solutions are available at: `http://people.bath.ac.uk/rm257/MA10192/`

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