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**Name:**

**Analysis II — Quiz 6**  
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**Q6.1. Implicit Function Theorem.**

Given the equations

$$x^2 - y^2 + u^2 + 2v^2 = 1,$$

$$x^2 + y^2 - u^2 - v^2 = 2$$

find all  $(x, y, u, v)$  such that  $u$  and  $v$  can be expressed as differentiable functions of  $x$  and  $y$ . Find also  $\frac{\partial u}{\partial x}$  and  $\frac{\partial v}{\partial x}$  in terms of  $x, y, u$  and  $v$ .