Problem statement Suppose \( R(x, y) = v(x + y^2) \) where \( v \) is a four times differentiable function of one variable. Suppose you know also that:

\[
v(0) = \alpha; \quad v'(0) = \beta; \quad v''(0) = \gamma; \quad v'''(0) = \delta; \quad v''''(0) = \varepsilon.
\]

Compute the following seven quantities in terms of \( \alpha, \beta, \gamma, \delta, \) and \( \varepsilon \):

\[
R(0, 0); \quad \frac{\partial R}{\partial x}(0, 0); \quad \frac{\partial R}{\partial y}(0, 0); \quad \frac{\partial^2 R}{\partial x^2}(0, 0); \quad \frac{\partial^2 R}{\partial y^2}(0, 0); \quad \frac{\partial^2 R}{\partial x \partial y}(0, 0); \quad \frac{\partial^4 R}{\partial x^2 \partial y^2}(0, 0).
\]