

3. (6 points) Let $F(x, y)$ and $G(t)$ be differentiable functions so that

$$F(1, 2) = 3 \quad F_x(1, 2) = -1 \quad F_y(1, 2) = 4 \quad G(1) = -3 \quad G'(1) = 2$$

Let $h(x, y) = F(2x - y, y^2 + x^2) + G(xy^2)$. Find $\frac{\partial h}{\partial y}(1, 1)$. Show organized work.

4. (6 points) $f(x, y, z) = 2x + 3yz - \ln(x + y + z)$. What is the equation for the tangent plane to the level surface of $f(x, y, z) = -1$ at $Q = (1, 1, -1)$?