

Q-2) Let $\omega = (x + 2y + 3z)^{15}$ where $x = (u - v)^4 - 16$, $y = \cos^5(u + v) - 2$ and $z = \ln(u^2 + v^2) - \ln 2 + 1$. Find $\frac{\partial \omega}{\partial u}$ at the point $(u, v) = (-1, 1)$.

Solution:

Using chain rule, first write $\omega_u = \omega_x x_u + \omega_y y_u + \omega_z z_u$. Then observe that $(x, y, z) = (0, -1, 1)$ at the point $(u, v) = (-1, 1)$. Putting these values in, you will find $\omega_u = -525$.