Term Test Bb version 1

(1) [5 points] Project $\vec{u} = (44/3, -127/3, 148/3)^\intercal$ onto the plane H containing $P = (-2, 3, -2), Q = (-1, 5, 1), R = (2, 6, 2)$ in order to find the distance between $\vec{u}$ and H. (Hint: If u_H is the projection, then the distance is $\|u - u_H\|$.)

(2) [5 points] Linearize the following function around $x = 2, y = \pi$.

$$f\left(\begin{bmatrix} x \\ y \end{bmatrix}\right) = \begin{bmatrix} x\cos(xy) \\ x^2 + 2y^2 \end{bmatrix} \tag{1}$$