

Term Test Bb version 2

(1) [5 points] Find the distance between the point $T = (7, -2, 12)$ and the plane containing $P = (8, -8, -1), Q = (1, -1, -1), R = (8, -22, 11)$. (Hint: Find the displacement vectors $\vec{PT}, \vec{PQ}, \vec{PR}$ and project \vec{PT} onto the plane spanned by \vec{PQ} and \vec{PR} ; then find the difference between \vec{PT} and its projection.)

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

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