

No calculators of any kind. Show all work.

1. Find (a) scalar and (b) vector projections of \overrightarrow{PQ} on \overrightarrow{PR} if $P(0, 0, 4)$, $Q(0, 3, -2)$, $R(3, 6, 2)$. [5]
2. Determine parametric equations of the line through $A(4, -2, 1)$ and $B(0, 3, 5)$ and its point of intersection with the xy -plane. [5]
3. Determine the volume of the parallelepiped with edges $\hat{i} + 2\hat{j}$, $\hat{j} + 2\hat{k}$ and $2\hat{i} + \hat{k}$. [5]