



Ross High School: Mathematics Department

Higher Mathematics: Homework 4

1. $\mathbf{a} = \begin{pmatrix} 3 \\ -1 \\ 2 \end{pmatrix}$, $\mathbf{b} = \begin{pmatrix} -4 \\ 0 \\ 2 \end{pmatrix}$. Calculate $|2\mathbf{a} - \mathbf{b}|$ (3)

2. The point Q divides the line joining P(-1, -1, 0) to R(5, 2, -3) in the ratio 2 : 1.
Find the coordinates of Q. (3)

3. $\mathbf{u} = 2\mathbf{i} - 2\mathbf{j} + 4\mathbf{k}$ and $\mathbf{v} = \mathbf{i} + a\mathbf{j} + \sqrt{7}\mathbf{k}$.
If $|\mathbf{u}| = |\mathbf{v}|$ find the value of a . (4)

4. With reference to a suitable set of coordinate axes, A, B and C are the points
(-8, 10, 20), (-2, 1, 8) and (0, -2, 4) respectively.
Show that A, B and C are collinear and find the ratio AB : BC (4)