SQA Past paper questions

2018 – Paper 1 – Question 12

Vectors $\mathbf{a}$ and $\mathbf{b}$ are such that $\mathbf{a} = 4\mathbf{i} - 2\mathbf{j} + 2\mathbf{k}$ and $\mathbf{b} = -2\mathbf{i} + \mathbf{j} + p\mathbf{k}$.

(a) Express $2\mathbf{a} + \mathbf{b}$ in component form. 1

(b) Hence find the values of p for which $|2\mathbf{a} + \mathbf{b}| = 7$. 3

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2006 – Paper 2 – Question 6

P is the point (–1, 2, –1) and Q is (3, 2, –4).

(*a*) Write down $\overrightarrow{PQ}$ in component form. 1

(*b*) Calculate the length of $\overrightarrow{PQ}$. 1

(*c*) Find the components of a unit vector which is parallel to $\overrightarrow{PQ}$. 1

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1998 – Paper 1 – Question 3

Vectors $\boldsymbol{p}$, $\boldsymbol{q}$ and $\boldsymbol{r}$ are defined by

$$\boldsymbol{p} = \boldsymbol{i} - \boldsymbol{j} - \boldsymbol{k},\ \boldsymbol{q} = \boldsymbol{i} + 4\boldsymbol{k} \text{ and } \boldsymbol{r} = 4\boldsymbol{i} - 3\boldsymbol{j}.$$

(*a*) Express $\boldsymbol{p} - \boldsymbol{q} + 2\boldsymbol{r}$ in component form. (2)

(*b*) Calculate $\boldsymbol{p}.\boldsymbol{r}$ (1)

(*c*) Find $|\boldsymbol{r}|$. (1)

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1997 – Paper 1 – Question 4

The position vectors of the points P and Q are $\boldsymbol{p} = -\boldsymbol{i} + 3\boldsymbol{j} + 4\boldsymbol{k}$ and $\boldsymbol{q} = 7\boldsymbol{i} - \boldsymbol{j} + 5\boldsymbol{k}$ respectively.

(*a*) Express $\overrightarrow{PQ}$ in component form. (2)

(*b*) Find the length of PQ. (1)

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1995 – Paper 1 – Question 1

Calculate the length of the vector $2i - 3j + \sqrt{3}k$. (2)

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1993 – Paper 1 – Question 1

A is the point $(-3,2,4)$ and B is $(-1,3,2)$. Find

(a) the components of vector $\overrightarrow{AB}$; (1)
(b) the length of AB. (2)

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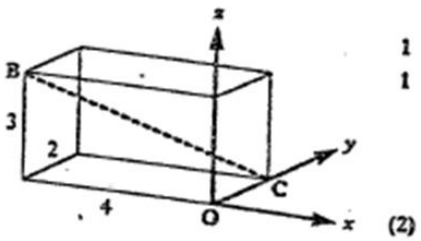
1990 – Paper 1 – Question 5

A cuboidal crystal is placed relative to the coordinate axes as shown opposite.

(a) Write down $\overrightarrow{BC}$ in component form. 1
(b) Calculate $|\overrightarrow{BC}|$. 1



(2)

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1989 – Paper 1 – Question 3

The vectors p, q and r are defined as follows:

$$p = 3i - 3j + 2k, \quad q = 4i - j + k, \quad r = 4i - 2j + 3k.$$

(a) Find $2p - q + r$ in terms of i, j and k. 1
(b) Find the value of $|2p - q + r|$. 2
(3)

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1987 – Paper 1 – Question 4

Calculate the length of the vector a, where

$$a = 5i + 2\sqrt{2}j - 4\sqrt{3}k. \quad (2)$$

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