10 Relative to an origin O, the position vectors of the points A, B and X are given by

$$\overrightarrow{OA} = \begin{pmatrix} -8 \\ -4 \\ 2 \end{pmatrix}, \quad \overrightarrow{OB} = \begin{pmatrix} 10 \\ 2 \\ 11 \end{pmatrix} \quad \text{and} \quad \overrightarrow{OX} = \begin{pmatrix} -2 \\ -2 \\ 5 \end{pmatrix}.$$

(i) Find $\overrightarrow{AX}$ and show that AXB is a straight line. [3]

The position vector of a point C is given by $\overrightarrow{OC} = \begin{pmatrix} 1 \\ -8 \\ 3 \end{pmatrix}$.

(ii) Show that CX is perpendicular to AX. [3]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

(iii) Find the area of triangle ABC. [3]

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....