29.2 Using vectors
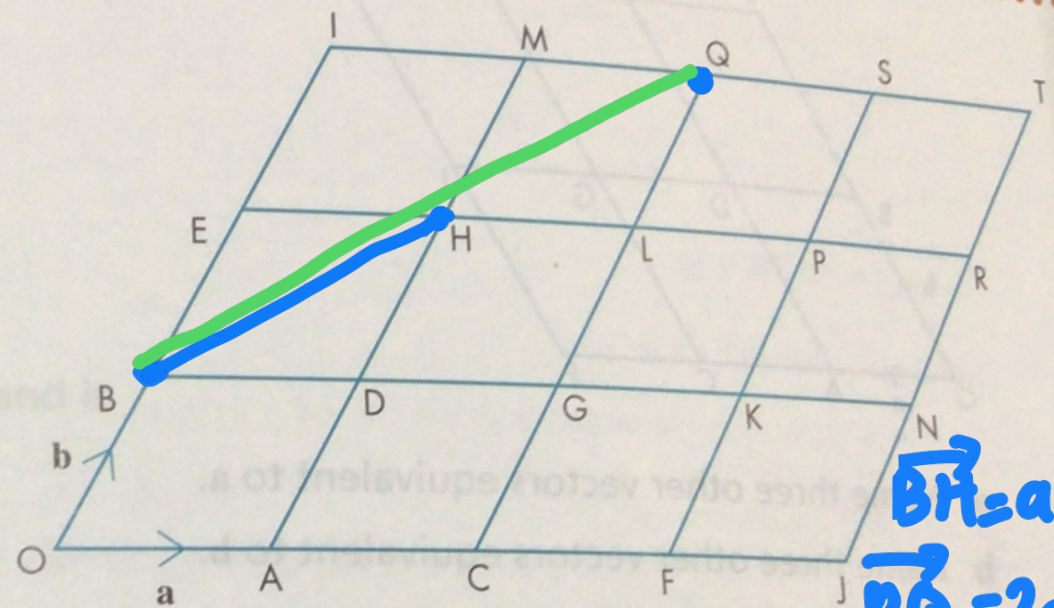
E

This grid is made of identical parallelograms.

O is the origin.

The **position vector** of A is

$$\overrightarrow{OA} = a$$

The **position vector** of B is

$$\overrightarrow{OB} = b$$

$\overrightarrow{BH} = a + b$

$\overrightarrow{BQ} = 2a + b$

You can give the position vectors of the other points in terms of **a** and **b**. For example:

The position vector of G = $\overrightarrow{OG}$ = 2**a** + **b**

The position vector of S = $\overrightarrow{OS}$ = 3**a** + 3**b**

$a + 2b$

You can write other vectors in terms of **a** and **b**. For example:

$$\overrightarrow{CL} = 2b$$

$$\overrightarrow{CP} = \overrightarrow{CL} + \overrightarrow{LP} = 2b + a \text{ or } a + 2b$$

$$\overrightarrow{CH} = \overrightarrow{CL} + \overrightarrow{LH} = 2b + -a = 2b - a$$

Example 1

a Using the grid above, write down these vectors in terms of **a** and **b**.

i $\overrightarrow{BH}$ ii $\overrightarrow{HP}$ iii $\overrightarrow{GT}$

iv $\overrightarrow{TI}$

M is the midpoint of FG and O is the

v $\overrightarrow{GO}$