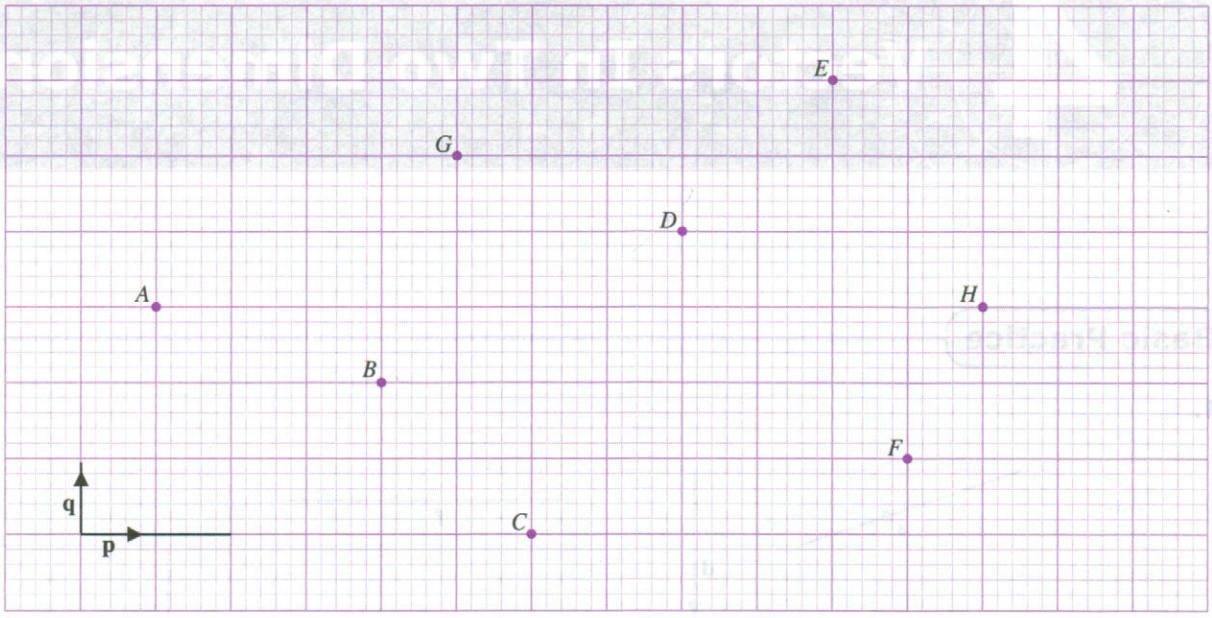
3. The points A to H, and the vectors $\mathbf{p}$ and $\mathbf{q}$ are shown on the diagram below.



Express each of the following vectors in terms of $\mathbf{p}$ and/or $\mathbf{q}$.

(a) $\overrightarrow{AH}$ **(b)** $\overrightarrow{AG}$

(c) $\overrightarrow{DE}$ **(d)** $\overrightarrow{GD}$

(e) $\overrightarrow{EH}$ **(f)** $\overrightarrow{FD}$

(g) $\overrightarrow{CA}$ **(h)** $\overrightarrow{DB}$

4. In the diagram, $PQRS$ is a quadrilateral, the diagonals PR and QS intersect at T and $QT = ST$.
Express each of the following as a single vector.

(a) $\overrightarrow{SP} + \overrightarrow{QR} + \overrightarrow{PQ}$

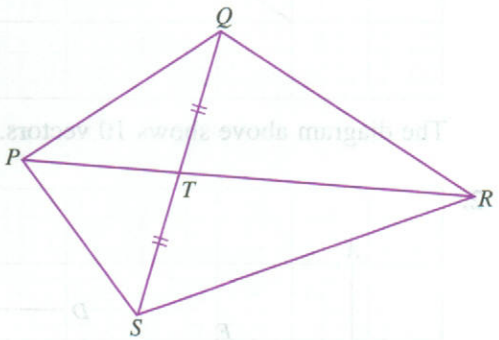
(b) $\overrightarrow{QR} + \overrightarrow{SQ} - \overrightarrow{PR}$

(c) $\overrightarrow{RQ} - (\overrightarrow{TQ} + \overrightarrow{PT})$

(d) $2\overrightarrow{QT} + \overrightarrow{SQ}$

(e) $\frac{1}{2}\overrightarrow{QS} + \overrightarrow{TP}$

(f) $\overrightarrow{SR} - 2\overrightarrow{TQ}$



5. In the diagram, $ABCD$ is a quadrilateral that is formed by three congruent equilateral triangles. E is a point on CD, $\overrightarrow{AB} = \mathbf{p}$ and $\overrightarrow{AD} = \mathbf{q}$.
Express each of the following vectors in terms of $\mathbf{p}$ and/or $\mathbf{q}$.

(a) $\overrightarrow{DC}$ **(b)** $\overrightarrow{EB}$

(c) $\overrightarrow{AE}$ **(d)** $\overrightarrow{CB}$

(e) $\overrightarrow{BD}$ **(f)** $\overrightarrow{CA}$