

STEP III, 1998, Q6

- 6
- (i) Show that four vertices of a cube, no two of which are adjacent, form the vertices of a regular tetrahedron. Hence, or otherwise, find the volume of a regular tetrahedron whose edges are of unit length.
 - (ii) Find the volume of a regular octahedron whose edges are of unit length.
 - (iii) Show that the centres of the faces of a cube form the vertices of a regular octahedron. Show that its volume is half that of the tetrahedron whose vertices are the vertices of the cube.

[A regular tetrahedron (octahedron) has four (eight) faces, all equilateral triangles.]



NextStepMaths.com

To view mark schemes, fully worked solutions and examiner's comments, and for more details about tutoring and other services offered, go to [NextStepMaths.com](https://www.NextStepMaths.com)