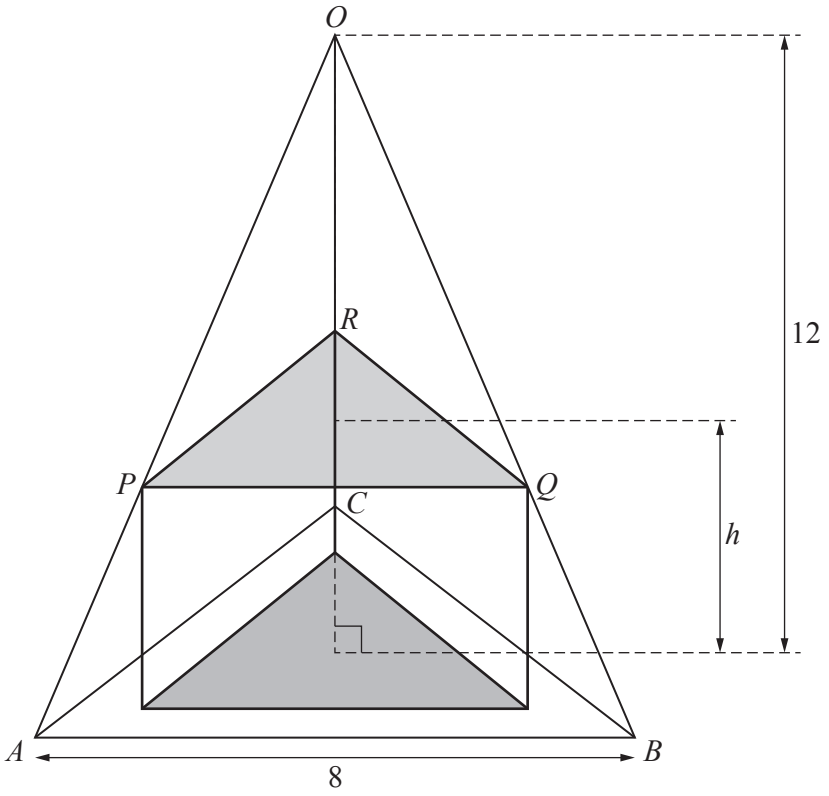
12 In this question all lengths are in centimetres.



The diagram shows a right triangular prism of height h inside a right pyramid.
The pyramid has a height of 12 and a base that is an equilateral triangle, ABC, of side 8.
The base of the prism sits on the base of the pyramid.
Points P, Q and R lie on the edges OA, OB and OC, respectively, of the pyramid $OABC$.
Pyramids $OABC$ and $OPQR$ are similar.

(a) Show that the volume, V, of the triangular prism is given by $V = \frac{\sqrt{3}}{9}(ah^3 + bh^2 + ch)$ where a, b and c are integers to be found. [4]

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(b) It is given that, as h varies, V has a maximum value. Find the value of h that gives this maximum value of V. [3]

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