11 The volume, V, of a cone with base radius r and vertical height h is given by $\frac{1}{3}\pi r^2 h$.
The curved surface area of a cone with base radius r and slant height l is given by $\pi r l$.

A cone has base radius r cm, vertical height h cm and volume V cm^3. The curved surface area of the cone is 4π cm^2.

(a) Show that $h^2 = \frac{16}{r^2} - r^2$. [4]

(b) Show that $V = \frac{\pi}{3}\sqrt{16r^2 - r^6}$. [2]

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(c) Given that r can vary and that V has a maximum value, find the value of r that gives the maximum volume. [5]

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