5 The curved surface area of a cylinder with radius r and height h is $2\pi rh$.

A closed cylinder has radius r cm and volume $1000\,\text{cm}^3$.

(a) Show that the total surface area of the cylinder is $2\pi r^2 + \frac{2000}{r}\,\text{cm}^2$. [3]

(b) Find the value of r which makes this area a minimum. You should show that your value of r gives a minimum for this area. [5]