A cylindrical tin of baked beans has a volume of 450 cm^3.

The radius of the tin is r cm and its height is h cm.

A net of the tin is shown in the diagram.
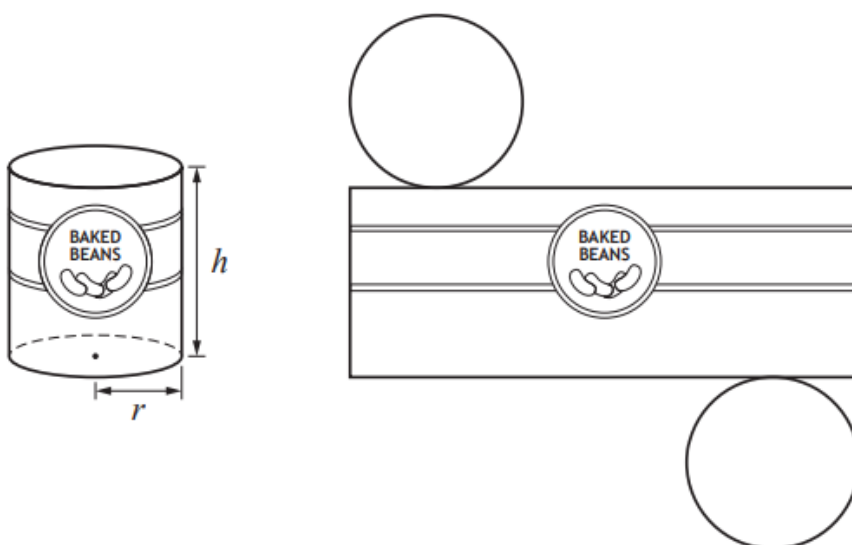
(a) Show that the surface area of the tin, A square centimetres, is given by

$$A(r) = 2\pi r^2 + \frac{900}{r}.$$

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(b) Determine the radius that will minimise the surface area.

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Answers:

(a) Obtain A(r, h) = 2πr^2 + 2πrh
Eliminate h using πr^2h = 450
Obtain the required expression for A(r)

(b) minimum when $r = \sqrt[3]{\dfrac{225}{\pi}}$