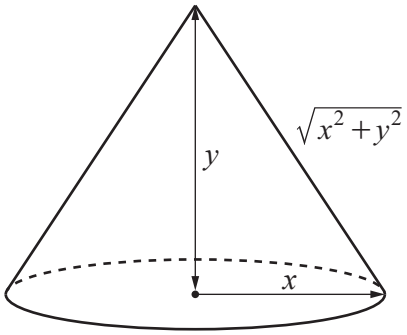
10 In this question all lengths are in centimetres.

The volume and curved surface area of a cone of base radius r, height h and sloping edge l are $\frac{1}{3}\pi r^2 h$ and πrl respectively.



The diagram shows a cone of base radius x, height y and sloping edge $\sqrt{x^2+y^2}$. The volume of the cone is 10π.

(a) Find an expression for y in terms of x and show that the curved surface area, S, of the cone is given by $S = \dfrac{\pi\sqrt{x^6+900}}{x}$. [3]

(b) Given that x can vary and that S has a minimum value, find the exact value of x for which S is a minimum. [5]

11 **(a)** The first three terms of an arithmetic progression are $\frac{1}{p}$, $\frac{1}{q}$, $-\frac{1}{q}$.

(i) Show that the common difference can be written as $-\frac{2}{3p}$. [3]

(ii) The 10th term of the progression is $\frac{k}{p}$, where k is a constant. Find the value of k. [2]