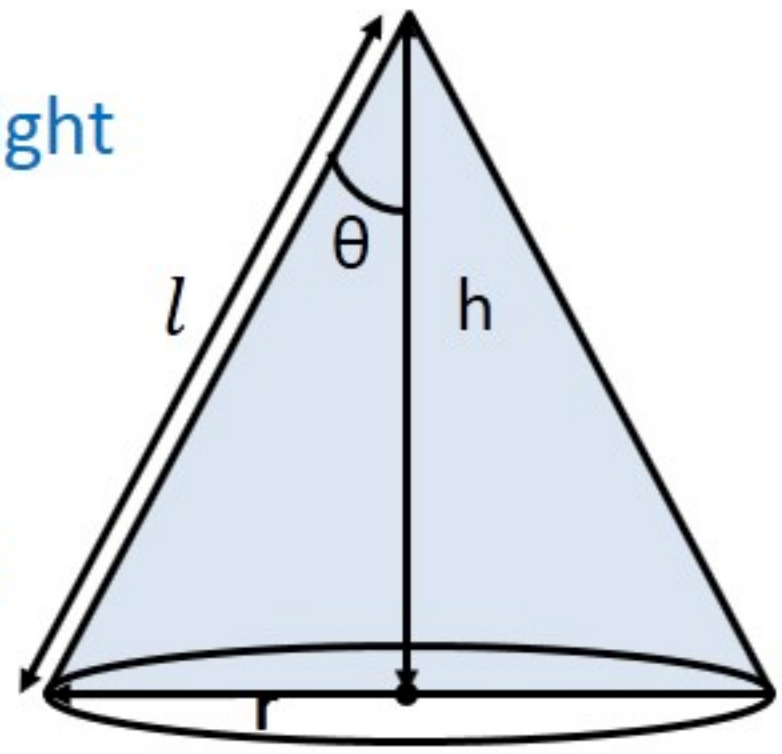
Ex 6.5,26

Show that semi-vertical angle of right circular cone of given surface area and maximum volume is $\tan^{-1}\left(\frac{1}{3}\right)$

Let r , h & l be the radius, height & slant height a cone respectively



And Let V & S be the volume & surface area & θ be a semi vertical angle of a cone

Given surface Area of a cone is constant

Surface Area of a cone $= \pi r^2 + \pi rl$

$$S = \pi r^2 + \pi rl$$

$$S - \pi r^2 = \pi rl$$

$$\frac{S - \pi r^2}{\pi r} = l$$

$$l = \frac{S - \pi r^2}{\pi r} \quad \ldots(1)$$