

'Filling A Weather Balloon'

$$\frac{dh}{dv} = \frac{16v}{5} - \frac{32v^2}{85}$$
$$0 = v \left(\frac{16}{5} - \frac{32v}{85} \right)$$

$$v \neq 0, \text{ thus } \frac{32v}{85} = \frac{16}{5}$$

$$v = 8.5 \text{ m}^3$$

$$\text{when } v = 8.5 \frac{d^2h}{dv^2} = -3.2, \text{ thus this is the maximum } v = 8.5 \text{m}^3, h = \frac{578}{15} \text{ km}$$