

Solving an optimization
Problem using Implicit Differentiation

Session 31

$$V = \pi r^2 h + \frac{2}{3} \pi r^3$$

$$A = 2\pi rh + 3\pi r^2$$

$$\frac{dA}{dr} = 2\pi h + 2rh \frac{dh}{dr} + 6\pi r$$

$$\frac{dV}{dr} = h' \pi r^2 + 2\pi rh + 2\pi r^2$$

$$0 = // \quad // \quad //$$

$$h' = -2 \cdot \frac{h+r}{r}$$

$$A' = -2\pi h + 2\pi r$$

a)

$$A' = 0 \Rightarrow h = r$$

b)

$$A' = 2\pi rh + 2\pi r^2$$

$$A' = 2h\pi + 2\pi rh' + 4\pi r$$

$$h' = -2 \cdot \frac{h+r}{r}$$

$$A' = -2\pi h$$

$$A' = 0 \Rightarrow h = 0$$