

Pb3

$$f(x) = -\frac{1}{2}x^2 + 2x + \frac{7}{2}$$

$$f'(x) = -x + 2$$

$$t: y = (-x_0 + 2)(x - x_0) - \frac{1}{2}x_0^2 + 2x_0 + \frac{7}{2}$$

$$(-4, 0) \in t \quad x = -4 \quad y = 0$$

$$0 = (-x_0 + 2)(-4 - x_0) - \frac{1}{2}x_0^2 + 2x_0 + \frac{7}{2}$$

$$0 = 4x_0 + x_0^2 - 8 - 2x_0 - \frac{1}{2}x_0^2 + 2x_0 + \frac{7}{2}$$

$$0 = \frac{1}{2}x_0^2 + 4x_0 - \frac{9}{2}$$

$$0 = x_0^2 + 8x_0 - 9$$

$$0 = (x_0 - 1)(x_0 + 9) \quad x_0 \geq 0$$

$$x_0 = 1$$

$$B(x_0, f(x_0))$$

$$\begin{aligned} f(x_0) &= -\frac{1}{2} + 2 + \frac{7}{2} \\ &= 5 \end{aligned}$$

$$B(1, 5)$$

Pb 4

$$V = x^2 y$$

$$y = \frac{V}{x^2}$$

$$S = 4\pi y + x^2$$

$$S = 4x \frac{V}{x^2} + x^2$$

$$x > 0$$

$$S = \frac{4V}{x} + x^2$$

$$S'(x) = -\frac{4V}{x^2} + 2x$$

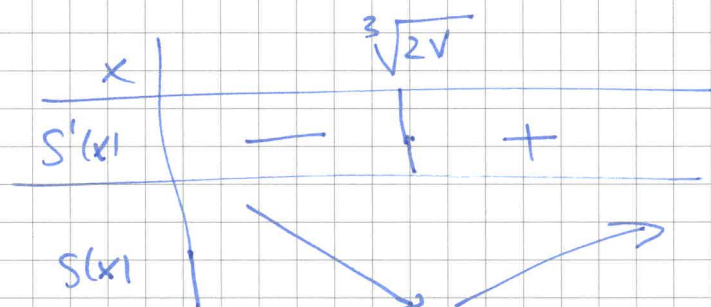
$$= \frac{-4V + 2x^3}{x^2}$$

$$S'(x) = 0$$

$$2x^3 = 4V$$

$$x^3 = 2V$$

$$x_0 = \sqrt[3]{2V}$$



Minimum de la surface quand $x_0 = \sqrt[3]{2V}$

$$x_0^3 = 2V$$

$$V = \frac{x_0^3}{2}$$

~~$$x_0^3 = \frac{2V}{2}$$~~

$$y_0 = \frac{V}{x_0^2} = \frac{\frac{x_0^3}{2}}{x_0^2} = \frac{x_0}{2}$$

$$y_0 = \frac{\sqrt[3]{2V}}{2}$$