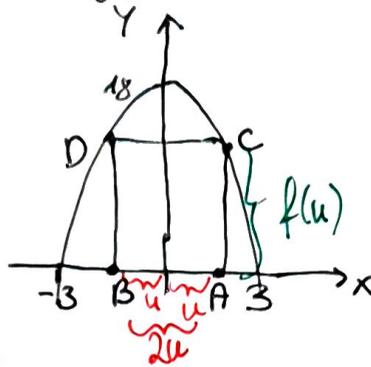


Lösung Extremwertaufgabe:

0. Skizze:



1. HB: $A = a \cdot b$

2. NB: $a = 2u$

$$b = f(u) = -2u^2 + 18$$

3. ZF: $A(u) = 2u \cdot (-2u^2 + 18) = -4u^3 + 36u$

4. Extrema: $A'(u) = -12u^2 + 36$

$$A''(u) = -24u$$

notw. Bed.: $A'(u) = 0$

$$-12u^2 + 36 = 0 \quad | -36$$

$$-12u^2 = -36 \quad | :(-12)$$

$$u^2 = 3 \quad | \sqrt{\quad}$$

$$u_1 = +\sqrt{3} \quad u_2 = -\sqrt{3}$$

hinr. Bed.: $A'(u) = 0$ & $A''(u) \neq 0$

$$A''(\sqrt{3}) = -24 \cdot \sqrt{3} < 0 \rightarrow \text{Max}$$

$$A''(-\sqrt{3}) = -24 \cdot (-\sqrt{3}) = 24\sqrt{3} > 0 \rightarrow \text{Min (n. rel.)}$$

5.) $a = 2\sqrt{3}$

$$b = -2 \cdot (\sqrt{3})^2 + 18 = -2 \cdot 3 + 18 = -6 + 18 = 12$$

$$A = 2\sqrt{3} \cdot 12 = \cancel{24} 24\sqrt{3}$$