

S 110 Nr. 10

Für $a < 0$

$$A(a) = \int_0^{\hat{\pi}} -\frac{1}{a} \sin(x) - a \cdot \sin(x) dx = \left[\frac{1}{a} \cos(x) + a \cos(x) \right]_0^{\hat{\pi}}$$

$$A(a) = \frac{1}{a} \cos(\hat{\pi}) + a \cdot \cos(\hat{\pi}) - \left\{ \frac{1}{a} \cdot \cos(0) + a \cdot \cos(0) \right\}$$

$$A(a) = -\frac{1}{a} - a - \frac{1}{a} - a = -2a - \frac{2}{a} ; A'(a) = -2 + \frac{2}{a^2}$$

notw. Bed. für Minimum $A'(a) = 0$

$$-2 + \frac{2}{a^2} = 0 \Rightarrow -2a^2 + 2 = 0 \Rightarrow a^2 = 1 \Rightarrow a = (\pm) 1$$

hinr. Bed für Minimum $A''(a) > 0$

$$A''(a) = -\frac{4}{a^3} ; A''(-1) = \frac{-4}{(-1)^3} = 4 \Rightarrow \text{Für } \underline{\underline{a = -1}}$$

ist der Flächeninhalt minimal.

S 110 Nr. 11 $f(x) = x^2 ; f'(x) = 2x$

$$t_a(x) = f'(a)(x-a) + f(a) = 2a(x-a) + a^2 = 2ax - 2a^2 + a^2$$

$$t_a(x) = 2ax - a^2$$

$$A(a) = \int_0^a x^2 - (2ax - a^2) dx = \left[\frac{x^3}{3} - \frac{2ax^2}{2} + a^2x \right]_0^a$$

$$\underline{\underline{A(a) = \frac{a^3}{3} - aa^2 + a^2a = \frac{a^3}{3}}}$$