

## 4.2: $B_2 = 0$

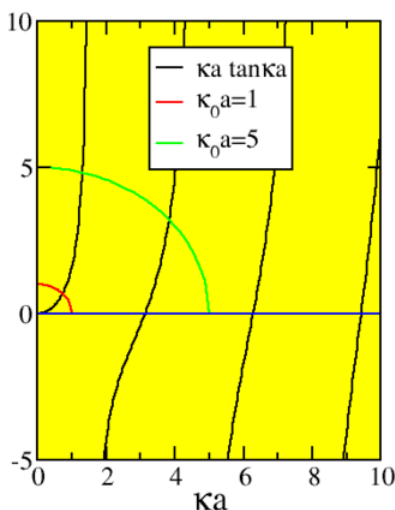
In the first case we read off that  $A_1 = B_3$ , and we find that  $k$  and  $\kappa$  are related by

$$ka = \kappa a \tan \kappa a. \quad (4.2.1)$$

This equation can be solved graphically. Use

$$k = \sqrt{-\kappa^2 + \kappa_0^2} \quad (4.2.2)$$

with  $\kappa_0^2 = \frac{2m}{\hbar^2} V_0$ , and find that there is always at least one solution of this kind, no matter how small  $V_0$ !



**Figure 4.2.1:** The graphical solution for the even states of the square well.

In the middle region all these solutions behave like sines, and you will be asked to show that the solutions are invariant when  $x$  goes to  $-x$ . (We say that these functions are even.)

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