



$$\psi_k = \sum_n e^{ikna} \chi_n$$

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$$k=0 \quad \psi_0 = \sum_n e^{i0} \chi_n = \sum_n \chi_n$$

$$= \chi_0 + \chi_1 + \chi_2 + \chi_3 + \dots$$

A horizontal line with points marked by shaded circles, representing the wavefunction  $\psi_0$  at  $k=0$ .

$$k=\frac{\pi}{a} \quad \psi_{\frac{\pi}{a}} = \sum_n e^{i\pi n} \chi_n = \sum_n (-1)^n \chi_n$$

$$= \chi_0 - \chi_1 + \chi_2 - \chi_3 + \dots$$

A horizontal line with points marked by circles. Shaded circles are at even positions (0, 2, 4, ...) and empty circles are at odd positions (1, 3, 5, ...), representing the wavefunction  $\psi_{\pi/a}$  at  $k=\pi/a$ .

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