Fourier Series written with cosine as first term

Fourier series may also be written with the cosine term first. Then the equations are:

$$\Psi(x) = \sum_{n=1}^{\infty} (A_n \cos k_n x + B_n \sin k_n x)$$

$$A_n = \frac{2}{L} \int_0^L \Psi(x) \cos \frac{2\pi n x}{L} \, dx$$

$$B_n = \frac{2}{L} \int_0^L \Psi(x) \sin \frac{2\pi n x}{L} \, dx$$

$$\Psi(x) = C_n \cos(k_n x + \phi_n)$$

$$C_N = \sqrt{{A_n}^2 + B^2}$$

$$\tan \phi_n = \frac{B_n}{A_n}$$