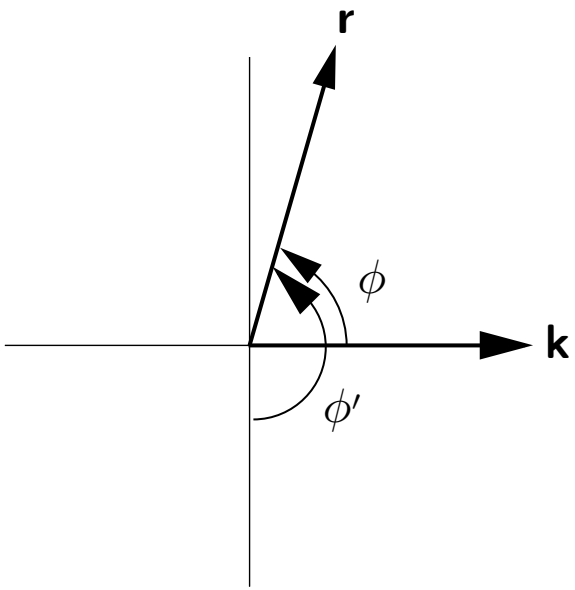

Figure 12.1: The position vector **r** and the wave vector **k** used in the Fourier expansion of a plane wave.

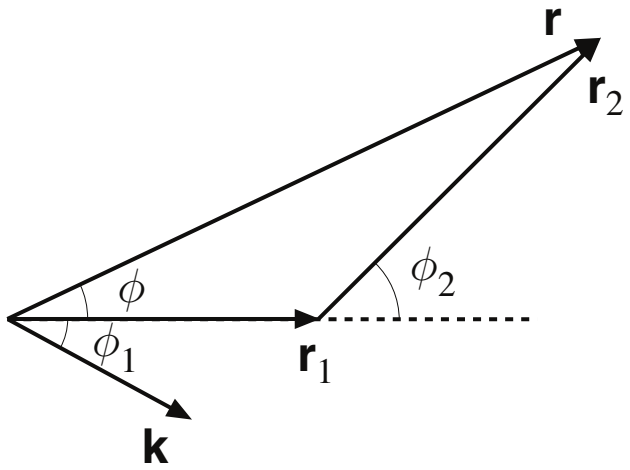

Figure 12.2: Geometry for the derivation of Graf's addition theorem for Bessel functions.

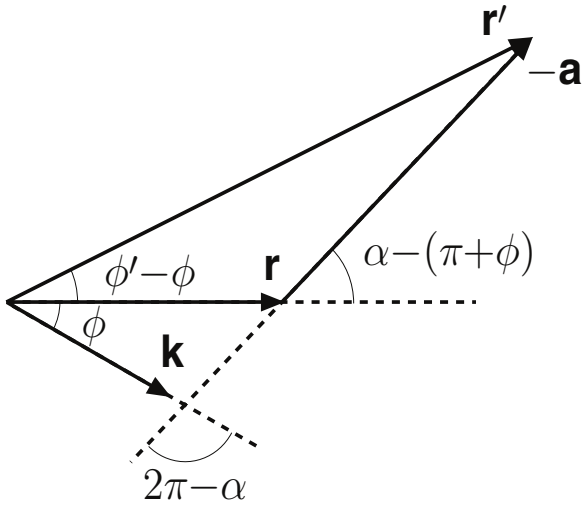

Figure 12.3: Geometry to illustrate that the Bessel functions carry representations of the translation subgroup of the Euclidean group in the plane. Since the x-axis is along $\mathbf{k}$, the angle ϕ' is the azimuthal angle of $\mathbf{r}' = \mathbf{r} - \mathbf{a}$, and α is the azimuthal angle of $\mathbf{a}$.

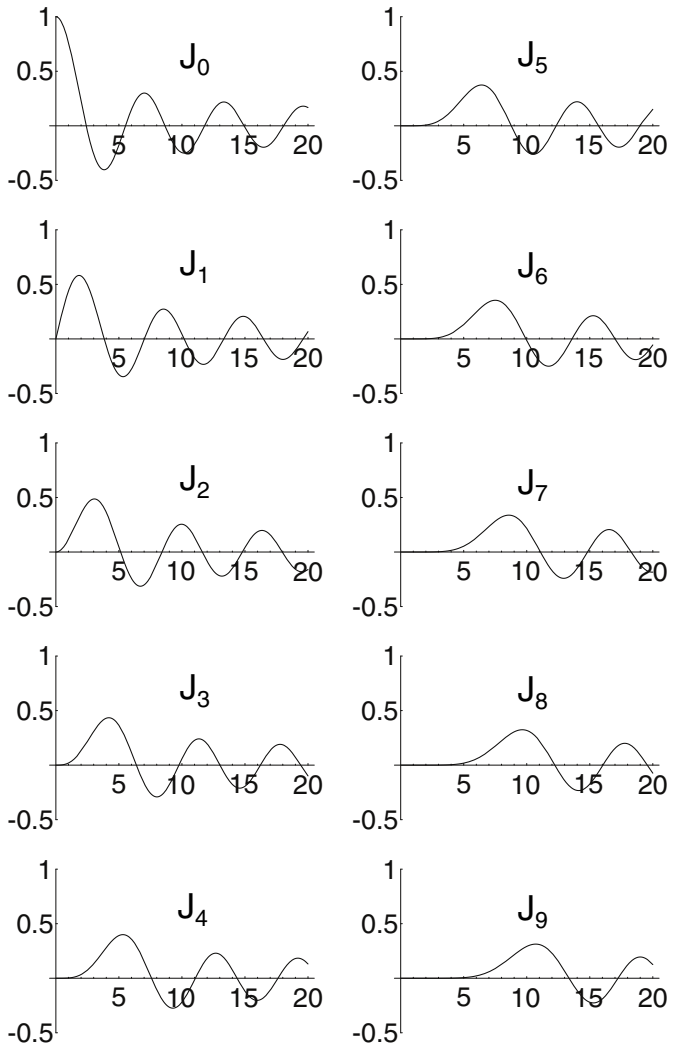

Figure 12.4: The values of the Bessel functions $J_0(x)$ through $J_9(x)$ (vertical axes) plotted as functions of x (horizontal axes).

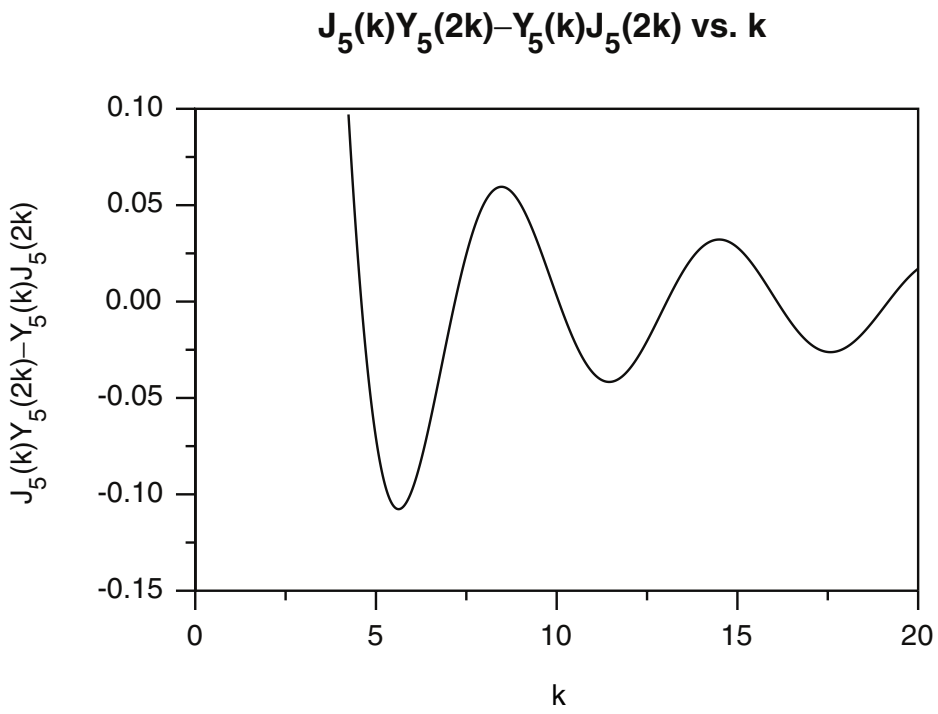

Figure 12.5: The value of the Wronskian determinant defined in Eq. (12.111), plotted versus k for $m = 5$, $a = 1$ and $b = 2$.

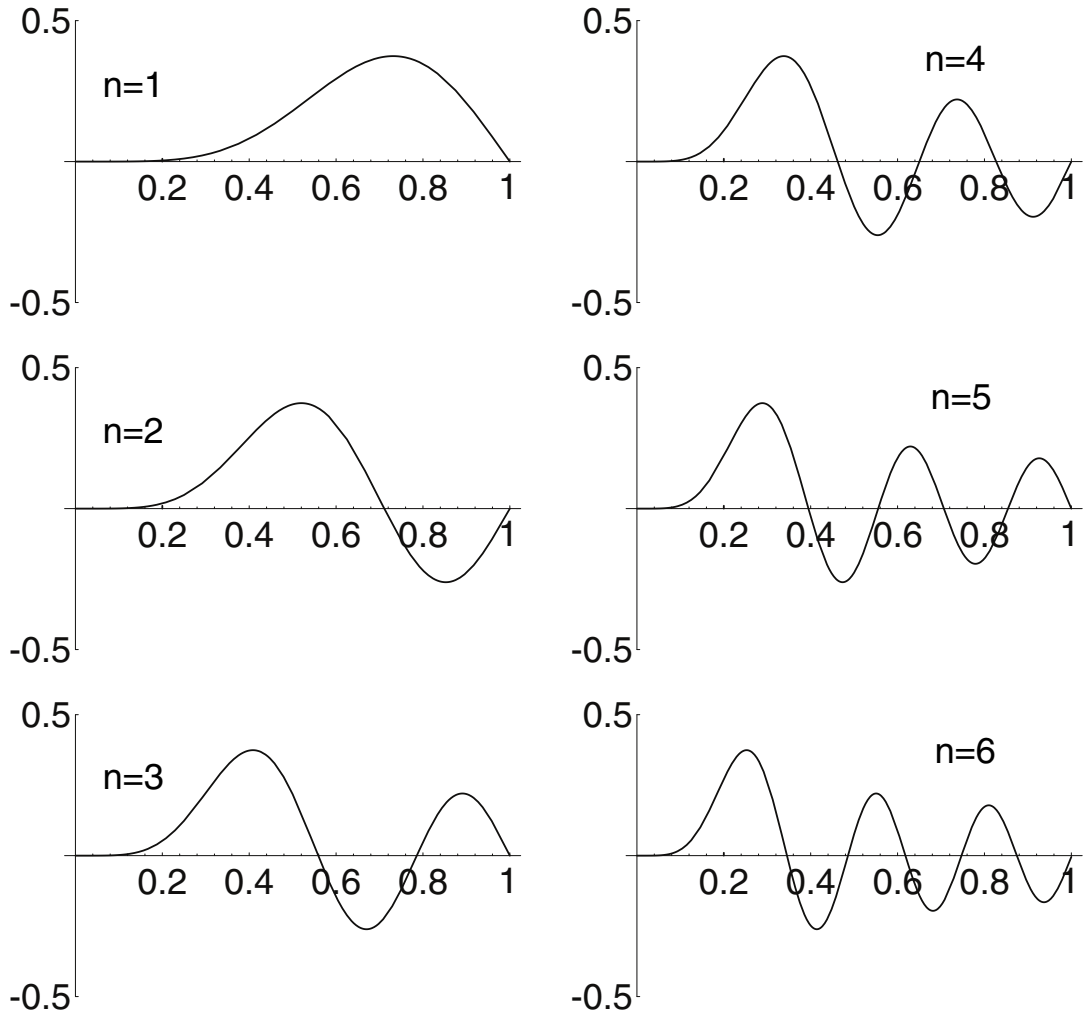

Figure 12.6: The orthogonal functions $J_5(j_{5,n}x)$ (vertical axes) as functions of x (horizontal axes) for $n = 1$ through $n = 6$. The integer n is equal to the number of zeros of $J_5(j_{5,n}x)$ for $x \neq 0$ in the interval $[0, 1]$.