$$\sum_{k=-\infty}^{\infty} \cos(k\pi/n)\sin(k\pi/s)$$

$$= (1/2)\sum_{k=-\infty}^{\infty} \{\sin[k\pi(1/n+1/s)] - \sin[k\pi(1/n-1/s)]\}$$

$$= 0$$

$$\sum_{k=-\infty}^{\infty} \sin(k\pi/n)\cos(k\pi/s) = 0$$

$$\sum_{k=-\infty}^{\infty}\left(\frac{\partial}{\partial \chi_k}\right)^2 = \sum_{n=1}^{\infty}\sum_{s=1}^{\infty}(\infty+1/2)\delta_{ns}\left(\frac{\partial}{\partial a_n}\frac{\partial}{\partial a_s}+\frac{\partial}{\partial b_n}\frac{\partial}{\partial b_s}\right)$$

$$= (\infty+1/2)\sum_{n=1}^{\infty}\left(\frac{\partial}{\partial a_n}\frac{\partial}{\partial a_n}+\frac{\partial}{\partial b_n}\frac{\partial}{\partial b_n}\right)$$

$$\frac{i\hbar}{\alpha}\alpha\sum_{n=1}^{\infty}\left\{\frac{\partial F}{\partial a_n}[a_n\cos(\pi/n) - b_n\sin(\pi/n) - a_n] + \frac{\partial F}{\partial b_n}[b_n\cos(\pi/n) + a_n\sin(\pi/n) - b_n]\right\}$$

$$= \frac{1}{2m}\frac{1}{\alpha}(-i\hbar)^2(\infty+1/2)\sum_{n=1}^{\infty}\left[\left(\frac{\partial}{\partial a_n}\right)^2 + \left(\frac{\partial}{\partial b_n}\right)^2\right]F$$