Math 301-162 Quiz 5 (A)

Name:.....Sec#:.....ID#:.....Ser#:.....

Q.1: Expand $f(x) = 3x$ in a Fourier Bessel series using the boundary condition $J_1(3\alpha) + \alpha J_1'(3\alpha)$. (Hint: Use $c_i = \dfrac{2\alpha_i^2}{(\alpha_i^2 b^2 - n^2 + h^2)J_n^2(\alpha_i b)} \int_0^b x J_n(\alpha_i x) f(x) dx$ when α_i are defined by $hJ_n(\alpha b) + \alpha b J_n'(\alpha b) = 0$.

Q.2: Find first three terms of Fourier Legendre series of $f(x) = x^2 + 2$, $-1 < x < 1$.

Hint: Use $c_n = \dfrac{2n+1}{2} \int_{-1}^{1} f(x) P_n(x) dx$