Math 301-101 Sec: 02 & 03 Quiz 5 (A)

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

Q:1 Expand $f(x) = 1$, $0 < x < 3$ in a Fourier–Bessel series using Bessel functions of order zero that satisfy $2J_0(3\alpha) + 3\alpha J_0'(3\alpha)$. (Justify your answer with reason).

Q:2 Find first three nonzero terms if Fourier–Legendre expansion of the function

$$f(x) = \begin{cases} 0 & \text{if} \quad -1 < x < 0 \\ 3x^2 & \text{if} \quad 0 \leq x < 1 \end{cases} .$$