Math 301-101 Sec: 02 & 03 Quiz 4 (A)

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

Q:1 Show that the set of functions $\left\{ \cos(\frac{n\pi}{p})x \right\}$ is an orthogonal set on $[0, p]$ for $n = 1, 2, 3, \cdots$. Also find norm of each function. (Justify your answer with reason).

Q:2 Find half range cosine expansion of

$$f(x) = \cos(x), \quad 0 < x < \frac{\pi}{2}.$$

Q:3 Find Fourier series expansion of

$$f(x) = \begin{cases} 1 & \text{if} \quad -5 < x < 0 \\ 1+x & \text{if} \quad 0 \leq x < 5 \end{cases} .$$