# Math 301-123 Quiz 4 A

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**Q:1** Find the Fourier series expansion of $f(x) = x + \pi$, $-\pi < x < \pi$.

**Q:2** Let $f(x) = \dfrac{1}{\pi} + \dfrac{1}{2}\sin x + \dfrac{1}{\pi}\sum_{n=2}^{\infty} \dfrac{(-1)^n + 1}{(1-n^2)} \cos nx$ is the Fourier series expansion of

$$f(x) = \begin{cases} 0 & -\pi < x < 0 \\ \sin x & 0 \le x < \pi \end{cases}$$

Show that $\dfrac{\pi}{4} = \dfrac{1}{2} + \dfrac{1}{1\cdot 3} - \dfrac{1}{3\cdot 5} + \dfrac{1}{5\cdot 7} - \dfrac{1}{7\cdot 9} + \cdots$

**Q:3** Find the Fourier series expansion of $f(x) = x + 1, \quad 0 < x < 1$