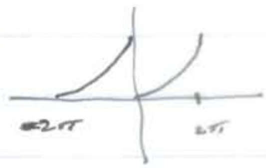
MT 253 ASSGT 7 Solutions

4. $f(x) = x^4, \quad 0 < x < 2\pi$

$f(x+2\pi) = f(x)$

$f(-x) \neq f(x)$ nor $-f(x)$

Neither odd nor even



8. $f(x) = \begin{cases} \cos^2 x, & -\pi < x < 0 \\ \sin^2 x, & 0 < x < \pi \end{cases}$

$f(-x) = \cos^2 x, \quad 0 < x < \pi$

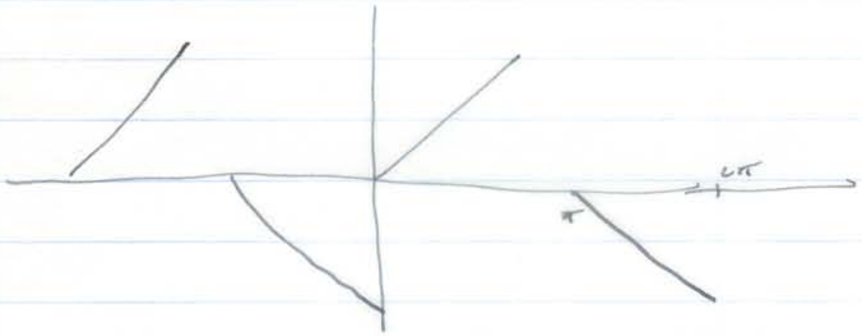
$\neq \sin^2 x$

& $f(-x) = \sin^2 x, \quad -\pi < x < 0$

$\neq \cos^2 x$

NOT ODD, NOT EVEN

14.



$f(x+2\pi) = f(x)$

not odd

not even

$$a_0 = \frac{1}{2\pi}\left(\int_0^{\pi} x\,dx + \int_{\pi}^{2\pi} (\pi - x)\,dx\right) = 0$$

$$a_n = \frac{1}{\pi}\left(\int_0^{\pi} x \cos nx\,dx + \int_{\pi}^{2\pi} (\pi - x)\cos nx\,dx\right)$$

$$= \begin{cases} 0, & n \text{ even} \\ -\dfrac{4}{\pi n^2} & n \text{ odd} \end{cases}$$

$$b_n = \frac{1}{\pi}\left(\int_0^{\pi} x \sin nx\,dx + \int_{\pi}^{2\pi} (\pi - x)\sin nx\,dx\right) = \begin{cases} 0, & n \text{ even} \\ \dfrac{2}{n}, & n \text{ odd} \end{cases}$$

F.S. $$-\frac{4}{\pi}\sum_{k=1}^{\infty} \frac{\cos(2k-1)}{(2k-1)^2} + 2\sum_{k=1}^{\infty} \frac{\sin(2k-1)}{2k-1}$$