MATH 445 ASSIGNMENT 3
Fall 2009
Prof. Alexander

Due Friday September 18.

Kreyszig:
11.1 p. 483 #2, 7, 9, 12, 13, 17
11.2 p. 490 #2, 3, 5
11.3 p. 496 #1, 4, 12, 16, 18, 25

Some even-numbered solutions:

11.2 (2) $2 + \frac{8}{\pi}\left(\sin\frac{\pi x}{2} + \frac{1}{3}\sin\frac{3\pi x}{2} + \frac{1}{5}\sin\frac{5\pi x}{2} + ...\right)$

11.3 (12) $\frac{4}{\pi^3}\left((\pi^2-4)\sin\pi x + \frac{1}{27}(9\pi^2-4)\sin 3\pi x + \frac{1}{125}(25\pi^2-4)\sin 5\pi x + ...\right)$
$-\frac{2}{\pi}\left(\sin 2\pi x + \frac{1}{2}\sin 4\pi x + \frac{1}{3}\sin 6\pi x + ...\right)$
(16) $\frac{1}{4} + \frac{4}{\pi^2}\left(\cos\frac{\pi x}{4} + \frac{1}{2}\cos\frac{2\pi x}{4} + \frac{1}{9}\cos\frac{3\pi x}{4} + \frac{1}{25}\cos\frac{\pi x}{4} + \frac{1}{18}\cos\frac{6\pi x}{4} + \frac{1}{49}\cos\frac{7\pi x}{4} + ...\right)$
(18)(a) $\frac{1}{4} - \frac{2}{\pi^2}\left(\cos 2\pi x + \frac{1}{9}\cos 6\pi x + \frac{1}{25}\cos 10\pi x + \frac{1}{49}\cos 14\pi x + ...\right)$
(b) $\frac{1}{\pi}\left(\sin 2\pi x - \frac{1}{2}\sin 4\pi x + \frac{1}{3}\sin 6\pi x - \frac{1}{4}\sin 8\pi x + ...\right)$

When you can do so readily, you should express answers in series notation, for example,

$$3 + \sum_{n=1}^{\infty}\left(\frac{(-1)^n}{n^2} - 2\right)\cos nx + \sum_{n \text{ even}}\frac{1}{2n}\sin nx.$$

If this cannot be readily done, then you can express your answer as in the solutions above, calculating enough terms to make the pattern clear.