Homework # 3, Math 143  Due Friday, October 18, 2013

This homework set has six (6) problems. Some of them are routine, others require more thought. You are encouraged to work with others and to ask questions of your instructor; however, you must write up your solutions independently. On this and all subsequent homework sets please write neatly in complete sentences. Writing mathematics is a craft, aim to hone this skill!

1. Determine convergence or divergence of
\[ \sum_{n=1}^{\infty} \frac{\sin(1/n)}{\sqrt{n}}. \]

2. Stewart Exercises 12.8: 10, 14, 22.


4. Let the function \( f \) be given by
\[ f(x) = 1 + 2x + x^2 + 2x^3 + x^4 + \cdots. \]
Find the domain of \( f \) and an explicit formula for the function \( f \) on that domain (like \( f(x) = x^2 + 3 + \sin(x) \), though of course that is not it!)

5. Sum the series
\[ \sum_{n=1}^{\infty} \frac{n^2}{2^n}. \]

6. Let \( g(x) \) be the fifteenth derivative of \( f(x) = \cos(x^3) \). What is \( g(0) \)?