Math 142, Exam 3, Spring 2016

Write everything on the blank paper provided. **You should KEEP this piece of paper.** If possible: return the problems in order (use as much paper as necessary), use only one side of each piece of paper, and leave 1 square inch in the upper left hand corner for the staple. If you forget some of these requests, don't worry about it – I will still grade your exam.

The exam is worth 50 points. Each problem is worth 10 points. Please make your work coherent, complete, and correct. Please $\boxed{CIRCLE}$ your answer. Please **CHECK** your answer whenever possible.

No Calculators or Cell phones.

1. Find $\int \frac{x^2 - 6x + 12}{(x-2)^3} dx$. **Please make sure that your answer is correct.**

2. Find $\int_{-4}^{7} \frac{1}{(x-5)^2} dx$.

3. Approximate $\sum_{k=1}^{\infty} \frac{1}{k^3}$ with an error at most $\frac{1}{100}$. **Please explain what you are doing and why.**

4. Find the Taylor polynomial $P_3(x)$ for $f(x) = \ln(x)$ centered about $a = 1$.

5. Where does the power series $f(x) = \sum_{n=1}^{\infty} \frac{(x-5)^n}{n2^n}$ converge? **Explain carefully. Be sure to account for all real numbers x .**