**NAME: (print!)** _____

**Section:** _____ **E-Mail address:** _____

**MATH 152 (01-03, 07-09), Dr. Z. , Fifth Practice Exam for Second Midterm, Tue. Nov. 20, 2012.**

**WRITE YOUR FINAL ANSWER TO EACH PROBLEM IN THE INDICATED PLACE (right under the question)** (when applicable)
**Explain your work!** Do not write below this line

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1. (out of 14)
2. (out of 14)
3. (out of 14)
4. (out of 14)
5. (out of 14)
6. (out of 14)
7. (out of 16)

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tot. (out of 100)

**1**. (14 points, 7 each) Find the volume obtained by rotating the region bounded between $y = x$ and $y = x^2$ around (a) the $x$-axis (b) the $y$-axis

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**Ans.** (a) (b)

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**2**. (14 points) Find the Maclaurin polynomial of degree 5 of $f(x) = \sin 5x$, *using the definition.*

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**Ans.**

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**3**. (14 points, 7 each) Evaluate

$$(a)\int_1^2 xe^{-x}\,dx \qquad\qquad (b)\int_1^2 (\ln x)^2\,dx$$

**4**. (14 points) Use the sum of the first 3 terms to approximate the sum of the series. Estimate the error.

$$\sum_{n=2}^{\infty} \frac{(-1)^n}{\ln n} \quad .$$

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**Ans.** Appx.= Error Bound=

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**5**. (14 points) Find the radius of convergence of the power series

$$\sum_{n=1}^{\infty} \frac{n^n}{2^n n!} x^n \quad ,$$

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**Ans.** radius of convergence=

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**6**. (14 points) Using any method, find the Maclaurin polynomial of degree 4 iof the function $f(x) = \sin x + e^{x^2} \cos x$

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**Ans.**

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**7**. (16 points) Evaluate the infinite series

$$\sum_{n=1}^{\infty} \frac{1}{n(n+2)} \quad ,$$

or state that it diverges.
**Hint:** Use partial fractions.

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**Ans.**

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