

NAME: (print!)

Section: E-Mail address:

MATH 152 (01-03, 07-09), Dr. Z. , Second 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)

tot. (out of 100)

1. (14 points) Decide whether the following improper integrals are convergent or divergent. Evaluate them, if possible

$$(a) \int_1^{\infty} \frac{x^2}{3x^3 + 1} \quad , \quad (b) \int_0^8 \frac{1}{x^{1/3}} \quad .$$

Ans. (a)

(b)

2. (14 points, 7 each) Determine whether the following series converge or diverge. Explain what test(s) you are using.

$$(a) \sum_{n=1}^{\infty} \frac{17 + 4\sqrt{n}}{n} ,$$

$$(b) \sum_{n=1}^{\infty} \frac{7 + 8n^2}{n^{10/3}} .$$

Ans. (a)

(b)

3. (14 points) Find the interval of convergence of the power series

$$\sum_{n=1}^{\infty} \frac{(x+1)^n}{2^n n^{1/3}} .$$

Ans.

4. (14 points, [(a)5,(b)5, c(4)]) Determine whether the following series converge or diverge. Show your work, and explain everything! (no credit for just stating the answer).

(a) $\sum_{n=1}^{\infty} \frac{(1+n+n^2)^7}{(n^3+2n^2+7n+11)^5}$, (b) $\sum_{n=1}^{\infty} \frac{13+4^n}{25+7^n}$, (c) $\sum_{n=1}^{\infty} \frac{n^6-6}{\sqrt{n^{10}+11n^9+103n}}$
.

Ans. (a)

(b)

(c)

5. (14 points) Find the area bounded between the curves $y = 3x + 1$ and $y = x^3 + 2x^2 + 1$.

Ans.

6. (14 points, 7 each) Determine whether the following series are absolutely convergent, conditionally convergent or divergent. Show your work! (no credit for just stating the answer)

$$(a) \sum_{n=1}^{\infty} \frac{(-1)^n n!^3}{n^{3n}} \quad ,$$

$$(b) \sum_{n=1}^{\infty} \frac{(2n)^n}{5^n n!} \quad .$$

Ans. (a)

(b)

7. (16 points) Use **the integral test** (no credit for other methods!) to decide whether the following infinite series is convergent

$$\sum_{n=2}^{\infty} \frac{1}{n(\ln n)^3}$$

Ans.:
