

MATH 152, Dr. Z. , **Answers to Practice for Second Midterm**

1. (a) div. (b) div.
2. conv.
3. (a) conv. (b) div.
4. $N=100000$
5. (a) conv. (b) div. (c) div.
6. (a) conv. (b) conv. (d) div.
7. $1/8 + 2/75 + 7/1250$; error $\leq 1/500$.
8. (a) conv. (b) div. (c) conv.
9. (a) abs. conv. (b) cond. conv.
10. (a) abs. conv. (b) div.
11. $R = 3$; $(-5, 1)$.
12. $R = 3$; $[-5, 1)$.
- 13.

$$\sum_{n=0}^{\infty} \frac{(-1)^n 16^n}{2} x^{4n+1} \quad ,$$

interval of convergence: $(-1/2, 1/2)$.

14.

$$C + \sum_{n=0}^{\infty} \frac{1}{8^{n+1}(3n+6)} x^{3n+6} \quad ,$$

radius of convergence= 2.

15.

$$\sum_{n=0}^{\infty} \frac{(-1)^n \cdot 3 \cdot 2^{2n}}{(2n)!} x^{2n}$$

16.

$$\sum_{n=0}^{\infty} \frac{(-1)^n 2^{2n}}{(2n)!} \left(x - \frac{\pi}{4}\right)^{2n}$$

17.

$$\sum_{n=0}^{\infty} \frac{4^n}{n!} x^{n+1}$$

18.

$$2x - 6x^2 + \frac{23}{3}x^3 - 5x^4 + \dots$$

19.

$$(1+x)^{1/10} = \sum_{n=0}^{\infty} \binom{\frac{1}{10}}{n} x^n \quad ,$$

or (in ... notation)

$$1 + \frac{1}{10}x + \frac{\left(\frac{1}{10}\right)\left(\frac{-9}{10}\right)}{2!}x^2 + \frac{\left(\frac{1}{10}\right)\left(\frac{-9}{10}\right)\left(\frac{-19}{10}\right)}{3!}x^3 + \dots \quad .$$

$1.01^{1/10}$ is appx. 1.0010 .
20.

$$\sum_{n=0}^{\infty} \binom{\frac{-1}{2}}{n} \frac{x^{2n+1}}{2n+1} \quad .$$