

Math 202 Quiz # 6

Name: Solution I.D. # _____ Section # _____

1. Find the radius of convergence and interval of convergence for the power series

$$\sum_{n=0}^{\infty} \frac{7^n}{n!} x^{n+1}$$

$$\lim_{n \rightarrow \infty} \left| \frac{u_{n+1}}{u_n} \right| = \lim_{n \rightarrow \infty} \left| \frac{\frac{7^{n+1} x^{n+2}}{(n+1)!}}{\frac{7^n x^{n+1}}{n!}} \right| = \lim_{n \rightarrow \infty} \left| \frac{7x}{n+1} \right|$$

$$= |x| \lim_{n \rightarrow \infty} \left| \frac{7}{n+1} \right| = 0$$

\Rightarrow the series is absolutely convergent on $(-\infty, \infty)$.
so $R = \infty$.

2. Write the first 4 terms of the series
- $(1 - 2x + x^2 - 2x^3 \dots)(x + 3x^2 + 5x^3 - 7x^4 + x^5 \dots)$

$$= x + 3x^2 + 5x^3 - 7x^4 + x^5 + \dots$$

$$- 2x^2 - 6x^3 - 10x^4 + 14x^5 + \dots$$

$$+ x^3 + 3x^4 + 5x^5 + \dots$$

$$- 2x^4 - 6x^5 - 10x^6 + \dots$$

$$= x + x^2 - 16x^4 + 14x^5$$