

Exam III Practice Exams Answers

Practice 1

1. a) diverges
b) diverges
c) converges
d) converges
2. a) $-8 < x < 2$
 $R = 5$
b) $-8 < x < 2$
c) none
3. You should use more than $\frac{998 + \sqrt{998^2 + 4 \cdot 998}}{2}$

terms

4. $p_3(x) = 1 + 3x + 6x^2 + 10x^3$

5. $\sum_{n=0}^{\infty} (-1)^n \left(\frac{3}{4}\right)^n x^{3n}$

Bonus 1) $-\sqrt[3]{\frac{4}{3}} < x < \sqrt[3]{\frac{4}{3}}$

Bonus 2) $\sum_{n=1}^{\infty} n x^{n-1}$

Practice 3

1. a) diverges
b) diverges
c) diverges
2. a) $-2 < x \leq 0$
 $R = 1$
b) $-2 < x < 0$
c) $x = 0$

Practice 2

1. a) diverges
b) diverges
c) converges
2. a) $0 \leq x < 2$
 $R = 1$
b) $0 < x < 2$
c) $x = 0$
3. $p_3(x) = \frac{1}{2} - \frac{\sqrt{3}}{2} \left(x - \frac{\pi}{3}\right) - \frac{1}{4} \left(x - \frac{\pi}{3}\right)^2 + \frac{\sqrt{3}}{12} \left(x - \frac{\pi}{3}\right)^3$
4. $\sum_{n=0}^{\infty} (-3)^n x^{n+2}$

Bonus $\sum_{n=0}^{\infty} (-1)^n \frac{x^{n+1}}{(n+1)(2n)!} + C$

3. $p_3(x) = \frac{\sqrt{3}}{2} + \frac{1}{2} \left(x - \frac{\pi}{3}\right) - \frac{\sqrt{3}}{4} \left(x - \frac{\pi}{3}\right)^2 - \frac{1}{12} \left(x - \frac{\pi}{3}\right)^3$

4. $\sum_{n=0}^{\infty} (-1)^n 5^n x^{n+12}$

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