

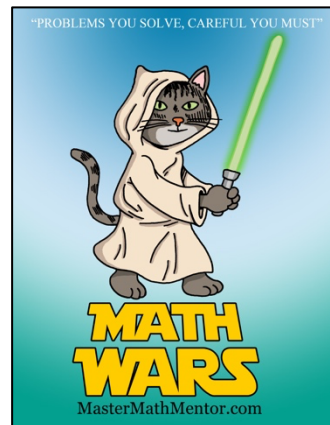
Math Wars – BC Calculus

Topic 219 – Power Series

Maximum Time: 9 Minutes



Directions: To start, you need to download the Math Wars application on your cell phone: Use the QR code or the url: <https://mastermathmentor.com/mmm/mathwars.ashx?key=219>



When ready, start the timer and then solve the problems below, entering your choice, A, B, C, D and pressing for each problem when you are sure of your answer. When complete, stop the timer. You will see problems you got correct in green and incorrect in red. You will receive a score based on how many problems you got right and your time. A perfect score is all problems correct using half the maximum time or less. You can text or email your friends with your results.

1. (1 pt) Which of the following are power series?

I. $\sum_{n=0}^{\infty} \left(n \sin \frac{3\pi n}{2} \right) (x^n)$

II. $\sum_{n=1}^{\infty} (n\sqrt{x})$

- A. I only B. II only C. I and II only D. Neither

2. (3 pts) Power series M, centered at $x = 2$ has a radius of convergence of 4. Power series N, centered at $x = 1$ has a radius of convergence of 1 and converges at $x = 0$. Power series $M + N$ must converge at which of the following values of x ?

- I. $x = 2$ II. $x = 3$ III. $x = 6$

- A. I only B. I and II only C. I, II and III D. None of these

3. (5 pts) The function f is defined by the power series $f(x) = 1 + (ax + b) + (ax + b)^2 + (ax + b)^3 + \dots, a, b \neq 0$ for all real numbers for which the series converges. What is the radius of convergence for f ?

- A. a B. b C. $\frac{1}{a}$ D. $\frac{b}{a}$

4. (7 pts) Find the interval of convergence for $\sum_{n=1}^{\infty} \frac{n(x-1)^n}{10^n}$.

- A. $(-11, 9)$ B. $[-11, 9)$ C. $(-9, 11)$ D. $[-9, 11)$

5. (9 pts) . The function f is defined by the power series $1 + \frac{x}{2} + \frac{x^2}{3} + \frac{x^3}{4} + \dots$ for all real numbers x for which the series converges. Which of the following values for x lie within the function's interval of convergence?

I. $x = 1$

II. $x = -\frac{9}{10}$

III. $x = -1$

A. I and II only

B. I and III only

C. II and III only

D. I, II, and III