

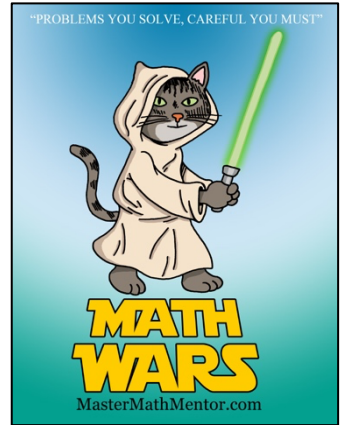
Math Wars – BC Calculus

Scrambled # 265



Maximum Time: 8 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=265>



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 series converge?

I. $8 - 8 + 8 - 8 + 8 - 8 + \dots$

II. $1 - 2 + 4 - 8 + 16 - 32 + \dots$

A. I only

B. II only

C. Both I and II

D. Neither I nor II

2. (3 pts) $\int_0^a \frac{1}{\sqrt{a-x}} dx =$

A. divergent

B. $\frac{2}{\sqrt{a}}$

C. $\frac{\sqrt{a}}{2}$

D. $2\sqrt{a}$

3. (5 pts) Let f be a function having derivatives for all orders of real numbers. The function and its first three derivatives at $x = 1$ are given in the table to the right. The fourth derivative of f satisfies the inequality

$|f^{(4)}(x)| \leq 24$ for all x in the interval $[1, 2]$. Find the maximum value of $f(1.5)$.

x	$f(x)$	$f'(x)$	$f''(x)$	$f'''(x)$
1	2	0	3	-12

A. $\frac{1}{16}$

B. $\frac{21}{16}$

C. $\frac{17}{8}$

D. $\frac{35}{16}$

4. (7 pts) Consider $\sum_{n=1}^{\infty} \frac{(-1)^{n+1} \sqrt{x}}{x+10}$. Which statement is true?

A. It converges because the terms decrease and $\lim_{n \rightarrow \infty} \frac{(-1)^{n+1} \sqrt{n}}{n+10} = 0$

B. It converges because the terms start to decrease if $n > 10$ and $\lim_{n \rightarrow \infty} \frac{(-1)^{n+1} \sqrt{n}}{n+10} = 0$

C. It converges because the terms start to decrease if $n > 100$ and $\lim_{n \rightarrow \infty} \frac{(-1)^{n+1} \sqrt{n}}{n+10} = 0$

D. It diverges

5. (9 pts) Find $\lim_{x \rightarrow 0^+} (e^x + 3x)^{1/x}$

A. 1

B. 3

C. 4

D. e^4