

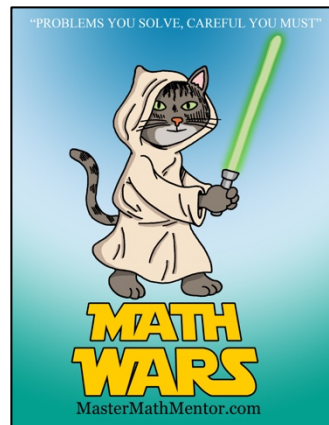
Math Wars – BC Calculus

Scrambled # 270



Maximum Time: 8.5 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=270>



When ready, start the timer and then solve the problems below, entering your choice, A, B, C, D and pressing **Submit** 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) Consider the following two statements: What words describe when they are true?

i. If the series $\sum_{n=1}^{\infty} a_n$ is convergent, then the sequence $\{a_n\}$ is convergent to zero.

ii. If the series $\sum_{n=1}^{\infty} a_n$ is divergent, then the sequence $\{a_n\}$ is divergent.

A. $\begin{cases} \text{i. always} \\ \text{ii. always} \end{cases}$

B. $\begin{cases} \text{i. always} \\ \text{ii. sometimes} \end{cases}$

C. $\begin{cases} \text{i. sometimes} \\ \text{ii. always} \end{cases}$

D. $\begin{cases} \text{i. sometimes} \\ \text{ii. sometimes} \end{cases}$

2. (3 pts) The approximation $e^x \approx 1 + x + \frac{x^2}{2}$ can be used when x is small. Find the maximum error when using this formula to approximate e^x when $x \leq 0.25$.

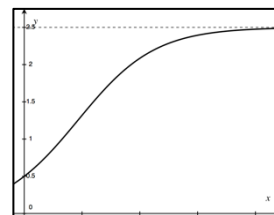
A. 1.28403

B. 1.28069

C. 0.00260

D. 0.00334

3. (5 pts) The figure to the right shows a graph that is a solution to which one of the following differential equations?



A. $\frac{dy}{dx} = 2x - 5x^2$

B. $\frac{dy}{dx} = 0.6y - 0.3y^2$

C. $\frac{dy}{dx} = 2.5y - y^2$

D. $\frac{dy}{dx} = 1.5y - 0.6y^2$

4. (7 pts) Using the ratio test on $\sum_{n=1}^{\infty} \frac{8^n}{n(-2)^{n+1}}$, the result is _____ telling us the series is _____

A. 1, inconclusive

B. -4, convergent

C. 0, convergent

D. 4, divergent

5. (9 pts) The function f is differentiable and its derivative is continuous. The table below give the value of f for $x = -2, 0, 2,$ and 4 . Find the approximate value of $\int_{-2}^4 x f'(x) dx$ using a trapezoidal rule with 4 trapezoids.

x	$f(x)$
-2	5
0	3
2	-1
4	2

A. 14

B. 7

C. -2

D. -12