

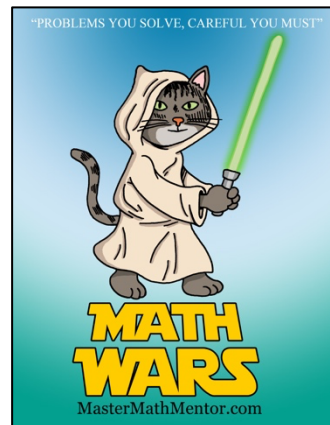
# Math Wars – BC Calculus

## Scrambled # 254



Maximum Time: 7.75 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=254>



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) The sequence  $a_n = \{5 + 5(-1)^{2n+1}\}$

- A. converges to 0      B. converges to 5      C. converges to 10      D. diverges

2. (3 pts) Which of the following limits is l'Hospital's rule *not* useful in determining?

- A.  $\lim_{x \rightarrow 0} x^x$       B.  $\lim_{x \rightarrow 0} \left( \frac{1}{x} - \frac{1}{\sin x} \right)$       C.  $\lim_{x \rightarrow \infty} \left[ (\ln x)^{1/x} \right]$       D.  $\lim_{x \rightarrow \infty} \left[ (e^{-x})^{e^x} \right]$

3. (5 pts) Find  $\frac{d^2y}{dx^2}$  for the parametric equations  $x = 3\sin\theta$  and  $y = \tan\theta$ .

- A.  $\frac{3\sin\theta}{\cos^5\theta}$       B.  $\frac{\sin\theta}{3\cos^5\theta}$       C.  $\frac{1}{3\cos^5\theta}$       D.  $\frac{3}{\cos^5\theta}$

4. (7 pts)  $a_n = \left\{ \frac{128}{2^{n-1}} \right\}$  can also be written as

- A.  $a_1 = 128, a_n = 2a_{n-1}$       B.  $a_1 = 128, a_n = a_{(n-1)/2}$       C.  $a_1 = 128, a_n = \frac{a_{n-1}}{2}$       D.  $a_1 = 256, a_n = \frac{a_{n-1}}{2}$

5. (9 pts) Find the sum of  $\frac{4}{9} - \frac{8}{27} + \frac{16}{81} - \frac{32}{243} + \dots$

- A.  $\frac{4}{15}$       B.  $\frac{4}{3}$       C.  $\frac{3}{15}$       D. 3