

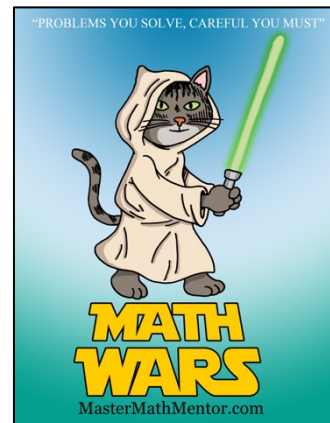
Math Wars – BC Calculus

Scrambled # 257



Maximum Time: 8.75 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=257>



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) If $\mathbf{u}(t) = \left\langle t, \frac{1}{t^2} \right\rangle$ and $\mathbf{v}(t) = \langle t^2, -t \rangle$, find $D_t[\mathbf{u}(t) \cdot \mathbf{v}(t)]$.

A. $\left\langle 3t^2, \frac{1}{t^2} \right\rangle$

B. $t^3 - \frac{1}{t}$

C. $3t^2 + \frac{1}{t^2}$

D. $\left\langle t^3, \frac{-1}{t} \right\rangle$

2. (3 pts) Which of the following series converge?

I. $\sum_{n=0}^{\infty} \frac{(-1)^n n}{n^2 + 4}$

II. $\sum_{n=0}^{\infty} \frac{(-1)^n n^2}{n^2 + 4}$

A. I only

B. II only

C. Both I and II

D. Neither I nor II

3. (5 pts) Let $y = f(x)$ be the solution to the differential equation $\frac{dy}{dx} = x^2 - 2y$ with initial condition

$f(-3) = 8$. If Euler's method is used, starting at $x = -3$ with step size of 1, for what value of x is the Euler approximation for $f(x)$ first less than zero?

A. -2

B. -1

C. 0

D. 1

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 unbounded on the right shaded region as shown in the figure to the right is rotated about the x -axis. Find the volume of the solid.

A. $\pi \ln 3$

B. $2\pi \ln 3$

C. $\pi \ln \frac{3}{2}$

D. $\pi \ln 2$

