

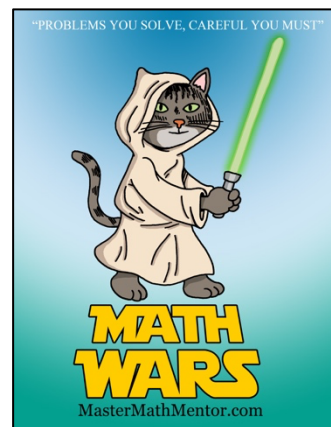
Math Wars – BC Calculus

Scrambled # 253



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=253>



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 expression that represents the arc length of $y = \ln x$ from $x = 1$ to $x = e$ is given by

A. $L = \int_1^e \left(1 + \frac{1}{x}\right)^2 dx$

B. $L = \int_1^e \left(1 + \frac{1}{\sqrt{x}}\right) dx$

C. $L = \int_1^e \sqrt{1 + \frac{1}{x}} dx$

D. $L = \int_1^e \sqrt{1 + \frac{1}{x^2}} dx$

2. (3 pts) The partial fraction decomposition of $\frac{2a}{x^3 - x}$ is

A. $\frac{a}{x+1} + \frac{a}{x-1} + \frac{2a}{x}$

B. $\frac{a}{x+1} + \frac{a}{x-1} - \frac{2a}{x}$

C. $\frac{2a}{x} - \frac{a}{x+1} - \frac{a}{x-1}$

D. $\frac{2a}{x} + \frac{a}{x+1} - \frac{a}{x-1}$

3. (5 pts) The fourth degree Taylor polynomial for $f(x) = e^x$ is used to approximate $e^1 - e^{-1}$. Find the error in using this approximation.

A. 0.333

B. 0.753

C. 1.419

D. 2.003

4. (7 pts) We use the 4th degree Maclaurin polynomial to approximate $\cos(0.5)$. Our approximation is off by less than one of the numbers below. Which is the best in describing the error?

A. $\frac{0.5^5}{5!}$

B. $\frac{0.5^6}{6!}$

C. 0.5^5

D. 0.5^6

5. (9 pts) Using the ratio test on $\sum_{n=0}^{\infty} \frac{5^{\frac{1}{2}n+1} n^2}{4^{n+1} (n+1)}$, the result is _____ telling us the series is _____

A. $\frac{\sqrt{5}}{4}$, Convergent

B. $\frac{5}{2}$, Divergent

C. $\frac{5}{4}$, Divergent

D. 1, inconclusive