

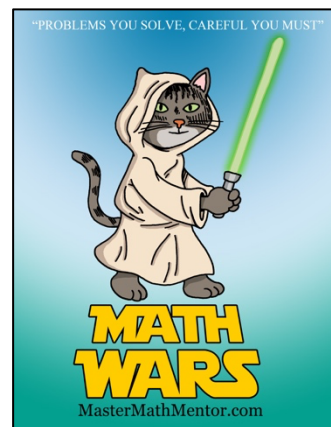
Math Wars – BC Calculus

Scrambled # 262



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=262>



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) Convert the rectangular equation $y = x^2$ to polar form.

A. $r = \cot \theta \csc \theta$

B. $r = \frac{\sin \theta}{\sec^2 \theta}$

C. $r = \tan \theta \sec \theta$

D. $r = \frac{\sec^2 \theta}{\sin \theta}$

2. (3 pts) Power series M, centered at $x = 2$ has a radius of convergence of 4. Power series N, centered at $x = 1$ has a radius of convergence of 1 and converges at $x = 0$. Power series $M + N$ must converge at which of the following values of x ?

I. $x = 2$

II. $x = 3$

III. $x = 6$

A. I only

B. I and II only

C. I, II and III

D. None of these

3. (5 pts) Using the limit comparison test, which of the following converges?

I. $\sum_{n=1}^{\infty} \frac{n}{n - \cos n}$

II. $\sum_{n=1}^{\infty} \frac{n}{n^2 - \cos^2 n}$

III. $\sum_{n=1}^{\infty} \frac{n}{n^3 - \cos^3 n}$

A. I only

B. II only

C. III only

D. II and III only

4. (7 pts) $\int \frac{x^2 + 1}{x^2 - 1} dx =$

A. $1 + \ln \left| \frac{x+1}{x-1} \right| + C$

B. $1 + \ln \left| \frac{x-1}{x+1} \right| + C$

C. $x + \ln \left| \frac{x-1}{x+1} \right| + C$

D. $x - \ln \left| \frac{x-1}{x+1} \right| + C$

5. (9 pts) The length of a curve from $x = 1$ to $x = 5$ is given by $L = \int_1^5 \frac{\sqrt{4+9x^4}}{2} dx$. If the curve passes through the point $(2, 10)$, which of the following could be the equation for this curve?

I. $y = \frac{x^3}{2} + 6$

II. $y = 14 - \frac{x^3}{2}$

III. $y = \frac{3x^2}{2} + 4$

IV. $y = 16 - \frac{3x^2}{2}$

A. I only

B. I and II only

C. III only

D. III and IV only