

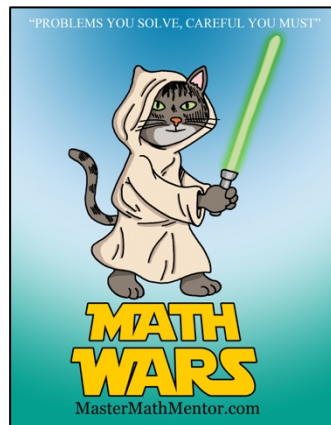
# Math Wars – BC Calculus

## Scrambled # 268



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=268>



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) Find the 3<sup>rd</sup> degree Maclaurin polynomial for  $f(x) = \cos x - \sin x$ .

A.  $1 + x - \frac{x^2}{2!} + \frac{x^3}{3!}$

B.  $1 - x + \frac{x^2}{2!} - \frac{x^3}{3!}$

C.  $1 + x - \frac{x^2}{2!} - \frac{x^3}{3!}$

D.  $1 - x - \frac{x^2}{2!} + \frac{x^3}{3!}$

2. (3 pts) Convert the polar equation  $r = \frac{6}{2\sin\theta - 3\cos\theta}$  to rectangular form.

A.  $y = \frac{6-2x}{3}$

B.  $y = \frac{6-3x}{2}$

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

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

3. (5 pts) Consider  $\sum_{n=1}^{\infty} \frac{(\cos \pi n) \sin n}{n^2}$ . In determining possible convergence, consider test I and then if inconclusive, test II. What is the conclusion and the test used to determine that?

I. Alternating Test

II. Direct Comparison Test

A. Convergent I

B. Convergent II

C. Divergent I

D. Divergent II

4. (7 pts) Find the arc length of  $y = \sqrt{4-x^2}$  from  $x = 0$  to  $x = 2$ .

A.  $\frac{1}{2}$

B.  $\pi$

C.  $2\pi$

D. 4

5. (9 pts) Consider the differential equation  $\frac{dy}{dx} = 2 \sin 2x \cos 2x$  with initial condition  $f(0) = 2$ . Find the difference between the exact value of  $f\left(\frac{\pi}{4}\right)$  and the Euler approximation of  $f\left(\frac{\pi}{4}\right)$  using two equal steps.

A. 0.893

B. 2.107

C. 1.107

D. 0.107