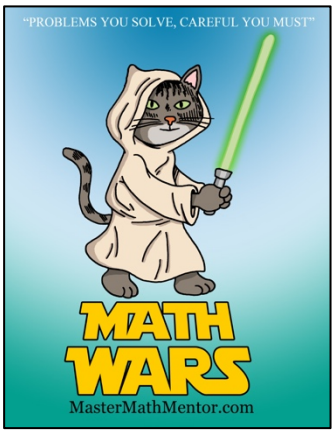
Math Wars – AB Calculus
Scrambled 186 – Integrals and Applications



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=186

When ready, start the timer and then solve the problems below, entering your choice, A, B, C, D and pressing Submit 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) $\int\left(x^3-\frac{1}{x^3}\right)^2 dx =$

A. $\frac{1}{3}\left(x^3-\frac{1}{x^3}\right)^3+C$

B. $\frac{x^7}{7}-2x-\frac{1}{6x^7}+C$

C. $\frac{x^7}{7}-\frac{1}{6x^7}+C$

D. $\frac{x^7}{7}-2x-\frac{1}{5x^5}+C$

2. (3 pts) What is the area enclosed by the curves $y=e-1/x$, $y=0$, $x=1$, and $x=e$?

A. $e-1$

B. $e-\frac{1}{e}$

C. e^2-e

D. e^2-e-1

3. (5 pts) $\int\frac{\tan(\ln x)}{x}dx =$

A. $\sec^2(\ln x)+C$

B. $\frac{\cos^2(\ln x)}{2}+C$

C. $-\ln\left|\cos(\ln x)\right|+C$

D. $\ln\left|\sin(\ln x)\right|+C$

4. (7 pts) Given the values of $f(x)$ below, for which of them does $\int_{-a}^{a} f(x)=0$, where a is a constant?

I. $f(x)=x^5-x^3+1$

II. $f(x)=\frac{x}{\sqrt{x^2+100}}$

III. $f(x)=x\cos x$

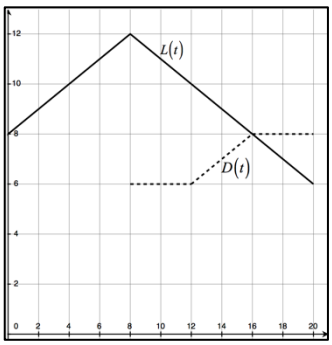
A. I and II only

B. I and III only

C. II and III only

D. II only

5. (9 pts) When a cruise ship arrives at its final port, people line up to get off as they cannot debark until the ship is secure. At 7:00 AM, there are 150 people in line to get off and new people line up according to the graph of $L(t)$ in the figure to the right, measured in people per minute. At 7:08 AM, they start letting people debark according to the graph of $D(t)$, also measured in people per minute. How many people are in line when the line is at its maximum?



A. 150
B. 246
C. 258
D. 262