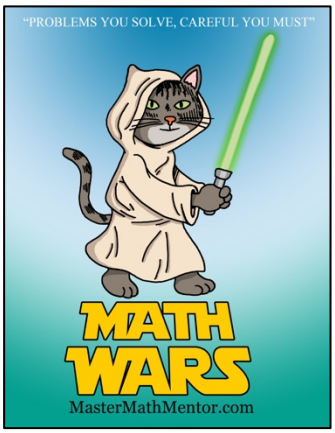
Math Wars – AB Calculus
Scrambled 172 – Integrals and Applications



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=172

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) If $a < b$, $\int_a^b -5\,dx =$

A. $5a-5b$ B. $5b-5a$ C. $5a+5b$ D. $-5a-5b$

2. (3 pts) $\int \frac{-6}{\sqrt{1-x^2}}dx =$

I. $-6\sin^{-1}x+C$ II. $6\cos^{-1}x+C$ III. $6\sin^{-1}x+C$ IV. $-6\cos^{-1}x+C$

A. I only B. I and II only C. III only D. III and IV only

3. (5 pts) The graph of $y=8+2x-x^2$ is shown in the figure to the right. Find the area of the shaded region.

A. 12 B. 36 C. 60 D. 84

4. (7 pts) Region R is bounded by the graphs of $y=\sqrt{4x}, y=0,$ and $x=6$. If R is rotated about the x-axis, find the value of k such that in the interval [0, 6] such that the line $x = k$ divides the solid into two equal volumes.

A. 3 B. $3\sqrt{2}$ C. 3.5 D. $2\sqrt{2}$

5. (9 pts) Find the particular solution that satisfies the differential equation $dT+(T-20)dt=0$ with initial condition $T(0)=-20$.

A. $T=-20e^{-t}$ B. $T=-20e^{t}$ C. $T=20-40e^{-t}$ D. $T=20-40e^{t}$