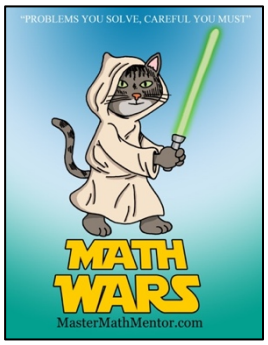
Math Wars – AB Calculus
Topic 129 – Fundamental Thm (Calculator)



Maximum Time: 8 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=129

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) Find the area under the curve $y = \cos^2 x^2$ between $x = 0°$ and $x = 30°$.

A. 0.440 B. 0.516 C. 0.846 D. 16.673

2. (3 pts) Which of the following statements about $\int_0^4 \left|9 - x^2\right| \, dx$ are true?

I. $\int_0^4 \left|9 - x^2\right| \, dx = \int_0^3 \left(9 - x^2\right) dx - \int_3^4 \left(x^2 - 9\right) dx$ II. $\int_0^4 \left|9 - x^2\right| \, dx = \int_{-4}^0 \left|x^2 - 9\right| \, dx$

A. I only B. II only C. I and II D. Neither

3. (5 pts) An oven was turned on and the temperature inside increased at the rate of $r(t) = -8.4t^2 + 46t + 2$, t measured in minutes and r measured in degrees Fahrenheit per minute. If the temperature of the oven was $315°\,\text{F}$ after 5 minutes, what was the temperature of the oven before it was turned on?

A. 70° B. 75° C. 80° D. 235°

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. $f(x) = \dfrac{x}{\sqrt{x^2 + 100}}$ 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) One of the following integrals cannot be calculated by analytic means. What is its value?

I. $\int_0^1 \left(\dfrac{2x}{x+2}\right) dx$ II. $\int_0^{\pi/4} \tan x \, dx$ III. $\int_0^{\pi} \left(\sin^2 x\right)\left(\cos^2 x\right) dx$ IV. $\int_0^1 e^{-2t} \sqrt{2 - e^{-2t}} \, dt$

A. 0.613 B. 0.347 C. 0.393 D. 0.515