

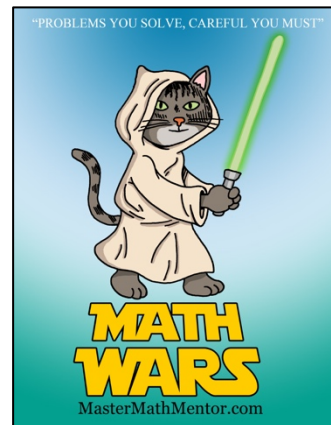
Math Wars – AB Calculus

Scrambled 182 – Integrals and Applications



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=182>

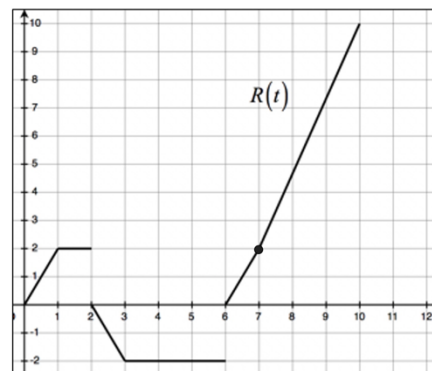


When ready, start the timer and then solve the problems below, entering your choice, A, B, C, D and pressing for each problem when you are sure of your answer. When complete, stop the timer. You will see problems you got correct in green and incorrect in red. You will receive a score based on how many 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 area under the curve $y = \cos^2 x^2$ between $x = 0^\circ$ and $x = 30^\circ$.

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

2. (3 pts) Mrs. Jones goes shopping very early in the day. She purchases some ground beef whose temperature is 40°F . On the drive home, the meat gets warmer and when she gets home, she waits an hour before putting it into the freezer. 4 hours later, she decides that she is going to use it that night for hamburgers so she leaves it out for it to thaw. But it isn't thawing fast enough so she puts into a microwave with a very slow defrost cycle for 3 hours. The graph of the rate of change of temperature of the meat $R(t)$ in degrees Fahrenheit per hour is shown in the figure to the right. What is the temperature of the meat when taken out of the microwave?

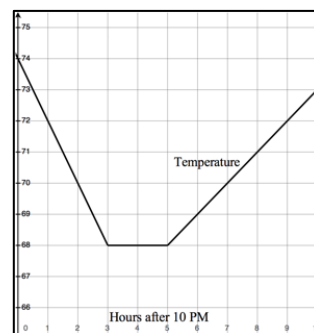


- A. 55°F B. 56°F C. 69°F D. 70°F

3. (5 pts) $\int e^x(x^2+1)dx =$

- A. $e^x(x^2 - 2x + 3) + C$ B. $e^x\left(\frac{x^3}{3} + x\right) + C$ C. $\frac{e^x(x^2+1)^2}{2} + C$ D. $\frac{e^x x^3}{3} + C$

4. (7 pts) Stu gets night sweats whenever the temperature in his bedroom is 71 degrees or higher. He lets the temperature drop in his bedroom in order to sleep cooler but also prefers to wake up in a warm bedroom and so uses a smart thermostat. The figure to the right shows the temperature in his bedroom from 10 PM to 8 AM. What is the average temperature in the room during the time he experiences night sweats?



- A. 71.1 B. 72.2
C. 72.4 D. 73.4

5. (9 pts) $\int \frac{x+5}{x^2+25} dx =$

A. $\ln(x+5) + C$

C. $5 \tan^{-1}\left(\frac{x}{5}\right) + C$

B. $\ln(x^2+25) + 5 \tan^{-1}\left(\frac{x}{5}\right) + C$

D. $\frac{1}{2} \ln(x^2+25) + \tan^{-1}\left(\frac{x}{5}\right) + C$