

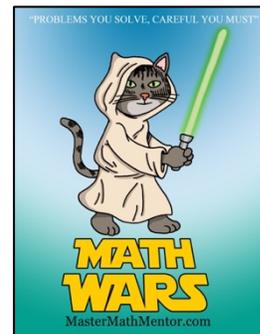
Math Wars – AB Calculus

Topic 135 – Integration 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=135>



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) Which of the following statements are true?

I. $R(b) = R(a) + \int_a^b R'(t) dt$

II. $\frac{d}{dx} \int_a^{x^2} f(t) dt = f(x^2)$

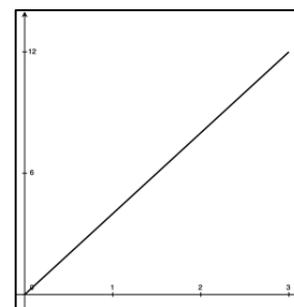
A. I only

B. II only

C. I and II

D. Neither

2. (3 pts) When a cruise ship towel folding machine is up to speed, towels are folded at the rate of 12 towels per minute. The rate $F(t)$ that towels are folded in the machine's first 3 minutes of use is given by the graph in the figure to the right. If 500 folded towels are available when the machine starts to work, how many folded towels are available after 3 hours?



A. 2,124

B. 2,142

C. 2,642

D. 2,678

3. (5 pts) In Spring, $g(t)$ is the rate of growth of leaves on a tree while $w(t)$ is the rate that wind blows leaves off the tree, both measured in leaves/day. Let $L(t) = \int_0^t [g(x) - w(x)] dx$ and $L'(7) = 500$. Which of the following is the correct interpretation?

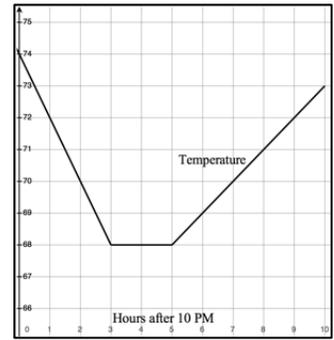
A. After a week, there are 500 more leaves on the tree than before.

B. After a week, the tree is gaining 500 leaves per day.

C. After a week, the tree's change in growth is 500 leaves per day per day.

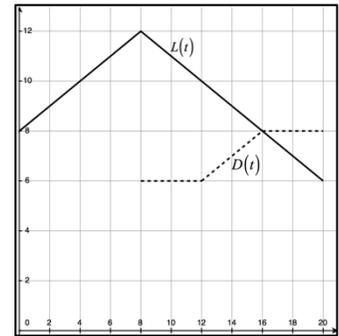
D. None of these

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) When a cruise ship arrives at its final port, people line up to get off as they cannot disembark 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 disembark 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