

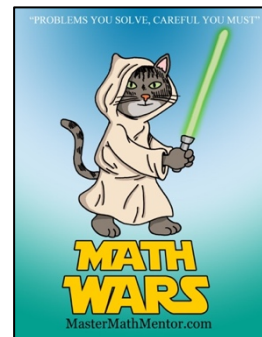
Math Wars – AB Calculus

Topic 130 – Motion Revisited



Maximum Time: 8.25 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=130>

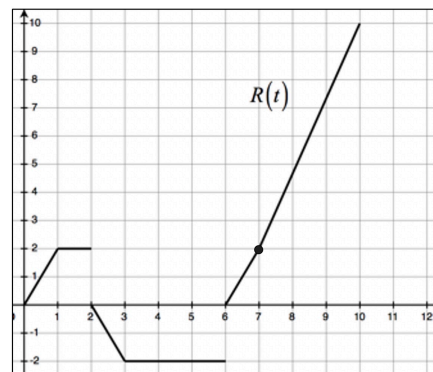


When ready, start the timer and then solve the problems below, entering your choice, A, B, C, D and pressing **Submit** for each problem when you are sure of your answer. When complete, stop the timer. You will see problems you got correct in green and incorrect in red. You will receive a score based 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) A camera is on a wire over a hockey rink that travels East-West over the ice. East is considered the positive direction and west is considered the negative direction. During the time interval $0 \leq t \leq 60$ seconds, the camera's velocity v , measured in feet/sec, is shown in the following table. Using a right Riemann sum, find the distance that the vehicle travels.

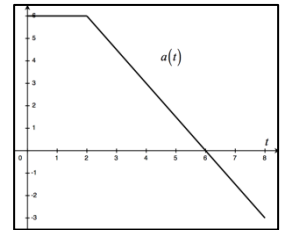
t (sec)	0	5	10	15	20	25	30	35	40	45	50	55	60
$v(t)$ ft/sec	-3	10	15	12	8	-2	-6	1	9	-5	-10	-2	2

- A. 155 ft B. 160 ft C. 385 ft D. 410 ft
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) A particle moves along the x -axis with acceleration $a(t) = -\left(\frac{12\ln t}{t} + 1\right)$. If the particle has velocity 10 at $t = 1$, describe the motion of the particle at $t = e$.
- A. moving right, slowing down B. moving right, speeding up
 C. moving left, slowing down D. moving left, speeding up

4. (7 pts) A particle is moving along a straight line. The graph of the acceleration of the particle, $a(t)$, is shown by the figure to the right for $0 \leq t \leq 8$. If $v(0) = -24$ what is the speed of the particle at $t = 8$?



- A. 0
 B. 3
 C. 21
 D. 45

5. (9 pts) A particle's traveling along a straight line has acceleration $a(t) = 2 \sec t \tan t$. If $v(0) = -2$, which of the following represents the distance that the particle travels on the interval $[0, \pi/2]$?

A. $\left| \int_0^{\pi/2} (2 \sec t - 4) dt \right|$

B. $\int_0^{\pi/3} (2 \sec t - 4) dt - \int_{\pi/3}^{\pi/2} (2 \sec t - 4) dt$

C. $\int_0^{\pi/2} |2 \sec t - 2| dt$

D. $-\int_0^{\pi/3} (2 \sec t - 4) dt + \int_{\pi/3}^{\pi/2} (2 \sec t - 4) dt$