

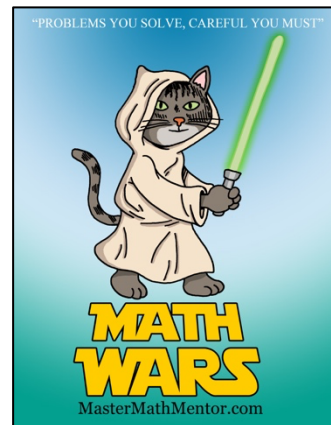
# Math Wars – AB Calculus

## Scrambled 170 – Limits & Derivatives



Maximum Time: 7.5 Minutes

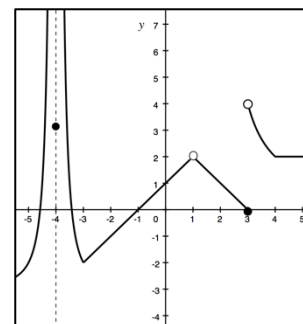
Directions: To start, you need to download the Math Wars application on your cell phone: Use the QR code or the url: <https://mastermathmentor.com/mmm/mathwars.ashx?key=170>



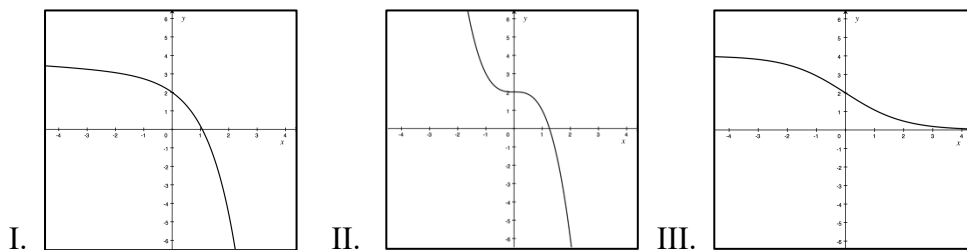
When ready, start the timer and then solve the problems below, entering your choice, A, B, C, D and pressing **Submit** for each problem when you are sure of your answer. When complete, stop the timer. You will see problems you got correct in green and incorrect in red. You will receive a score based 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) At how many locations does the function to the right fail continuity?

- A. 2  
B. 3  
C. 4  
D. 5



2. (3 pts) Which of the following graphs of  $f(x)$  has the characteristic that  $f'(x) < 0$  and  $f''(x) < 0$ ?



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

3. (5 pts) A doctor take the pulse of patient 3 times during an office visit. The reading can vary as the patient might be initially nervous. To approximate the patient's pulse for the visit, Doctor Goldman simply averages the 3 pulses while Dr. Corson examines the expression  $0.5(x - a)^2 + (x - b)^2 + (x - c)^2$  where  $a$  is the first reading while  $b$  and  $c$  are the second and third. His approximation is the value of  $x$  that minimizes this expression. If  $a = 120$ ,  $b = 80$  and  $c = 70$ , what is the difference between Dr. Goldman's and Dr. Corson's approximation for the pulse?

- A. 0  
B. 6  
C. 10  
D. 12

4. (7 pts) Use the table to find  $h'(0)$  if  $h(x) = \frac{f(x) - g(x)}{f(x)}$

$f(0)$	$g(0)$	$f'(0)$	$g'(0)$
4	-3	$\pi$	-1

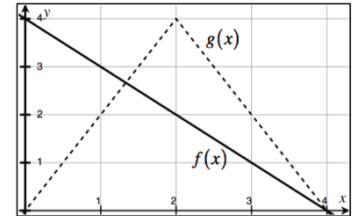
A.  $\frac{4-3\pi}{16}$

B.  $\frac{-4-3\pi}{16}$

C.  $\frac{\pi+1}{\pi}$

D.  $\frac{12+3\pi}{16}$

5. (9 pts) To the right are the graphs of  $f$  and  $g$ . If  $h(x) = [f(3x) - g(4-x)]^2$ , find  $h'(1)$ .



- A. 2  
C. -20

- B. -18  
D. 10