

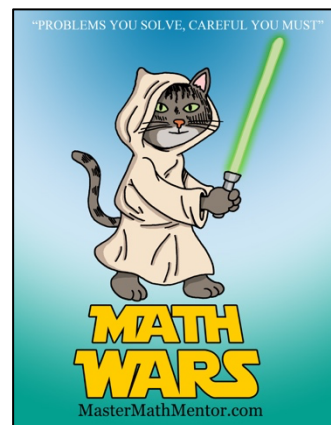
Math Wars – AB Calculus

Scrambled 159 – 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=159>



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) The inverse to $f(x)$ passes through (b, a) . The derivative of the inverse at $x = b$ is given by

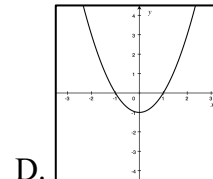
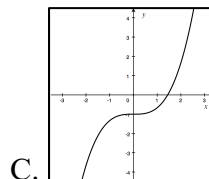
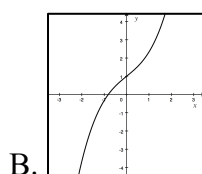
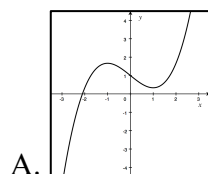
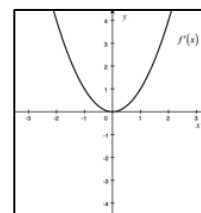
- A. $\frac{1}{f'(a)}$ B. $\frac{1}{f'(b)}$ C. $f'\left(\frac{1}{a}\right)$ D. $f'\left(\frac{1}{b}\right)$

2. (3 pts) Determine how many features the function $f(x) = \frac{x^2 - 2x}{x^4 - 4x^2}$ has.

- I. a hole at $x = 0$ II. A hole at $x = 2$ III. A discontinuity at $x = -2$ IV. A discontinuity at $x = 2$

- A. 1 B. 2 C. 3 D. 4

3. (5 pts) The graph of $f'(x)$ is shown to the right. If the graph is translated one unit down, which of the following shows the possible function associated with the new graph?



4. (7 pts) Let $f(x) = \sin^2 x - x^2$. Which of the following statements are true about f when $x = 0$?

- I. The second derivative test is conclusive
 II. f has a relative maximum
 III. f has a relative minimum

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

5. (9 pts) If $f(x) = \frac{-1}{2x}$, find $f'(x)$

A. $\frac{-1}{2}$

B. $\frac{1}{2x}$

C. $\frac{1}{2x^2}$

D. does not exist