

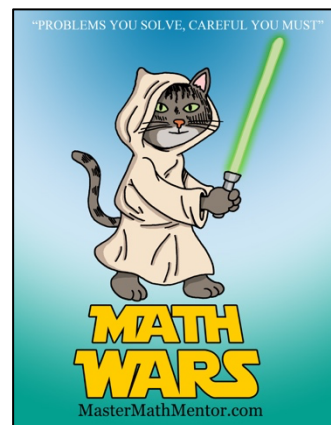
Math Wars – AB Calculus

Scrambled 166 – Limits & Derivatives



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=166>



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) Suppose the graph of $f'(x)$ is the x -axis. The graph of $f(x)$ could be

I. the x -axis II. All lines parallel to the x -axis

- A. I only B. II only C. Both I and II D. Both I and II and other lines

2. (3 pts) $f(x) = \sqrt[4]{x^3} - \sqrt[3]{x^4}$, find $f'(x)$

- A. $\frac{-7}{12x^{19/12}}$ B. $\frac{4}{3}\sqrt[3]{x} - \frac{3}{4\sqrt[4]{x}}$ C. $\frac{3}{4}\sqrt[4]{x} - \frac{4}{3}\sqrt[3]{x}$ D. $\frac{3}{4\sqrt[4]{x}} - \frac{4}{3}\sqrt[3]{x}$

3. (5 pts) Find the difference between the absolute maximum and absolute minimum value of

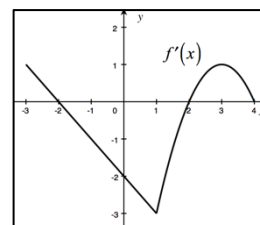
$$f(x) = \ln(2x^3 + 3x^2 + 9) \text{ for } -2 \leq x \leq 0.$$

- A. 1 B. $\ln 5$ C. $\ln 10$ D. $\ln 2$

4. (7 pts) A bowling ball is dropped from a 200 ft tower onto a piece of bulletproof glass to see if the glass will shatter. How fast in mph is the bowling ball moving at impact?

- A. 38.57 mph B. 56.57 mph C. 77.14 mph D. 113.14 mph

5. (9 pts) The graph of $f'(x)$ is shown to the right. How many of the following statements are untrue?



- i. f is increasing on $(-3, -2)$ ii. f has a relative minimum at $x = 1$
 iii. f is differentiable at $x = 1$ iv. f is concave down on $(2, 4)$
 v. f' has a relative maximum at $x = 3$ vi. f'' is decreasing on $(-3, 0)$

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