

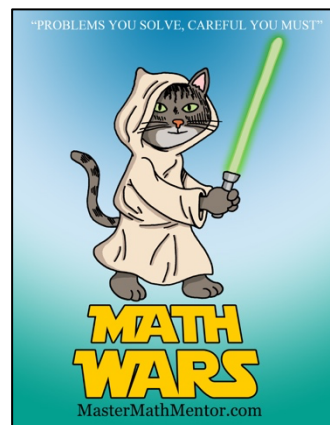
Math Wars – AB Calculus

Scrambled 162 – Limits & Derivatives



Maximum Time: 6.75 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=162>



When ready, start the timer and then solve the problems below, entering your choice, A, B, C, D and pressing 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) For $f(x) = \frac{\pi}{2}$, what is $f'\left(\frac{\pi}{2}\right)$

- A. 0 B. $\frac{1}{2}$ C. $\frac{\pi}{2}$ D. $\frac{\pi^2}{4}$

2. (3 pts) Find the difference between the absolute maximum and absolute minimum value of $f(x) = 9x^2 - 2x^3 + 1$ on $[0, 4]$.

- A. 1 B. 4 C. 11 D. 27

3. (5 pts) If $f(x) = \frac{2x+6}{x-4}$, use the tangent line to f at $x = 3$ to approximate $f(\pi)$ with $\pi \approx \frac{22}{7}$

- A. $\frac{86}{7}$ B. -10 C. 8 D. -14

□

4. (7 pts) Let $f(x) = \sin 2x + \cos 2x$. Find the value(s) of c that that satisfies the Mean-Value Theorem for f on $[0, \pi]$.

- A. $\frac{\pi}{8}$ only B. $\frac{\pi}{8}$ and $\frac{5\pi}{8}$ only C. $\frac{\pi}{4}$ only D. $\frac{\pi}{4}$ and $\frac{3\pi}{4}$ only

5. (9 pts) An enemy missile is flying horizontally at a maximum height 1,024 feet. A projectile is fired vertically to intercept it. What is its minimum initial velocity?

- A. $144 \frac{\text{ft}}{\text{sec}}$ B. $256 \frac{\text{ft}}{\text{sec}}$ C. $432 \frac{\text{ft}}{\text{sec}}$ D. $512 \frac{\text{ft}}{\text{sec}}$