

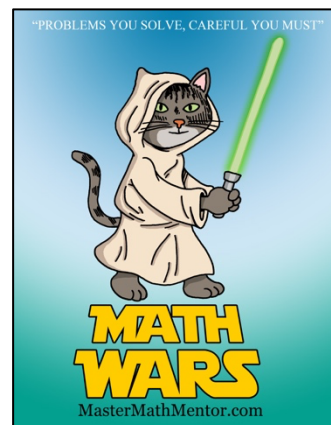
Math Wars – BC Calculus

Topic 211 – Taylor Polynomials



Maximum Time: 8.75 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=211>



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) Let $P_4(x) = 5 - 2(x-1) + 6(x-1)^2 + \frac{3}{8}(x-1)^4$ be the 4th degree Taylor polynomial for the function f about $x = 1$. What is the value of $f^{(4)}(1)$?

- A. 9 B. $\frac{1}{64}$ C. $\frac{3}{8}$ D. $\frac{3}{256}$

2. (3 pts) Let f be a function having derivatives for all orders of real numbers. The 5th degree Taylor polynomial for f about $x = -3$ is given by $P_5(x) = -3 - \frac{2}{3}(x+3)^3 + k(x+3)^5$, where $k \neq 0$. If $f^{(5)}(-3) = 20$, find $P_5(-4)$.

- A. $\frac{13}{6}$ B. $\frac{1}{6}$ C. $\frac{-5}{2}$ D. $\frac{-19}{3}$

3. (5 pts) Let f be a function having derivatives for all orders of real numbers. The first three derivatives of f at $x = 1$ are given in the table below. Use the third-degree Taylor polynomial at $x = 1$ to approximate $f(-1)$.

x	$f(x)$	$f'(x)$	$f''(x)$	$f'''(x)$
1	-6	-8	20	3

- A. $\frac{23}{2}$ B. 46 C. 58 D. 66

4. (7 pts) Use the 2nd degree Taylor polynomial about $x = 0$ for $f(x) = e^{-x/4}$ to approximate $e^{1/2}$.

- A. $\frac{25}{32}$ B. $\frac{41}{32}$ C. $\frac{7}{8}$ D. $\frac{13}{8}$

5. (9 pts) For the 47th degree Maclaurin polynomial for $f(x) = \sin x - \sin(-x)$, what is the coefficient for x^{47} ?

A. $\frac{2}{47}$

B. $\frac{2}{46!}$

C. $\frac{-2}{46!}$

D. $\frac{-2}{47!}$