

Math Homework on Taylor Polynomial and its Remainder

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Math 431 Homework

Consider the function $f(x) = \ln(x^2) + \sin x$,

1. Use Maple to find the fourth degree Taylor polynomial P_4 for the function f at $x_0 = 2$.
2. By choosing $x = 1.8$, explain why there is a $c \in (1.8, 2)$ so that the remainder
$$R_4(x) = f(x) - P_4(x) = \frac{f^{(5)}(c)}{5!}(x - 2)^5.$$
3. Follow Dr. Yang's paper (https://php.radford.edu/~ejmt/deliveryBoy.php?paper=eJMT_v1n2p4) on page 136 to define your F and G analogously. Graph and solve for the number $c \in (1.8, 2)$ by using F and G .
4. Follow Dr. Yang's paper on Section 4.2 and find your F_0, F_1 , and F_2 .
5. Graph the remainder R_2 and F_2 together to see if they are close to each other.