

PROBLEM SET #7

Due Friday, November 8, 2024 @ 12:30 pm
Submit as single pdf file to Canvas

Remember that you need to explain and show the steps in your answers!

1. Let $f(x) = \sin(x)$.
 - (a) What is $P_3(x)$, the 3rd degree Maclaurin polynomial for $\sin(x)$?
 - (b) Use your expression for $P_3(x)$ to approximate $\sin(3)$. Do you think your approximation is very accurate?
 - (c) Find $P_9(x)$ and use it to approximate $\sin(3)$.
 - (d) Compare your answer to (c) with the value that your calculator (or WolframAlpha) gives for $\sin(3)$. How close is your approximation?

2.
 - (a) Use a 7th degree Maclaurin polynomial for $f(x) = e^x$ to approximate \sqrt{e} .
 - (b) Compare your answer to the value your calculator (or WolframAlpha) gives for \sqrt{e} . How close is your answer from part (a)?

3. Evaluate the following indefinite integrals.
 - (a) $\int x^4 - \sec(x) \tan(x) + \sin(x) dx$
 - (b) $\int 3(\sin(x))^2 \cos(x) dx$
 - (c) $\int 2^x - \frac{2}{x^3} dx$