Chapter 10.1 Taylor Polynomials

Calculus II

Spring 2021

College of the Atlantic

1. Let $f(x) = e^x$. Find the first four Taylor polynomials approximating $f(x)$. That is, find $P_0(x)$, $P_1(x)$, $P_2(x)$, and $P_3(x)$,

2. Using a calculator, evaluate $f(0.5)$, $P_0(0.5)$, $P_1(0.5)$, $P_2(0.5)$, and $P_3(0.5)$.

3. Using a calculator, evaluate $f(2)$, $P_0(2)$, $P_1(2)$, $P_2(2)$, and $P_3(2)$.

4. Plot $f(x)$, $P_0(x)$, $P_1(x)$, $P_2(x)$, and $P_3(x)$ all on the same axes. What do you notice?

5. Let $f(x) = \cos(x)$. Find the first several Taylor polynomials approximating $f(x)$.

6. Plot $f(x)$ along with several Taylor polynomials on the same axes.

7. Let $f(x) = \ln(x)$. Find the first several Taylor polynomials approximating $f(x)$ near $x = 1$.

8. Plot $f(x)$ along with several Taylor polynomials on the same axes.