

# AUC apCalculus BC

## Classwork 12/13/23

### PROBLEM 1.5.

Calculate the following Taylor Polynomials using elegant methods:

- (1)  $T_{4, \frac{1}{x}, 7}(x)$ .
- (2)  $T_{9, \sin(x^4), 0}(x)$ .
- (3)  $T_{9, 4 \sin(3x) + 6 \cos(5x), 0}(x)$ .
- (4)  $T_{9, \frac{1}{1+x^3}, 0}(x)$ .
- (5) (Extra Credit)  $T_{7, \frac{1}{1+(x-2)^2}, 2}(x)$ .

PROBLEM 1.3. Compute the following Taylor Polynomials and give a detailed proof either by the definition or by using "The Calculus of Taylor Polynomials". Provide an estimate of the error and write each function in terms of its Taylor polynomial and the corresponding error:

- (1)  $T_{2n+1, \sin(x), 0}(x)$ .
- (2)  $T_{n, \frac{1}{1-x}, 0}(x)$ .
- (3)  $T_{n, \ln(1+x), 0}(x)$ .
- (4)  $T_{n, e^x, 0}(x)$ .

### PROBLEM 1.4.

Calculate the following Taylor Polynomials using elegant methods:

- (1)  $T_{4, \frac{1}{x}, 5}(x)$ .
- (2)  $T_{9, \sin(x^4), 0}(x)$ .
- (3)  $T_{9, 4 \sin(5x) + 6 \cos(7x), 0}(x)$ .
- (4)  $T_{9, \frac{1}{1+x^3}, 0}(x)$ .