A COMPLETED REPORT ON

THE PROJECT TITLE :

N-TH POLYNOMIALS WITH (ALL) INTEGER ROOTS AND INTEGER CRITICAL POINTS AND MISSING SOME INTEGER COEFFICIENTS

by

Aniruth Phon-On

Supported by Internal Budget of Prince of Songkla University in year 2012
Grant No: SAT550320S

September 2015

ABSTRACT

Given a natural number n , and let $f(x)$ be a polynomial of the form

$$f(x) = a_n x^n + a_{n-1} x^{n-1} + \cdots + a_1 x + a_0,$$

where all a_i s are integers and some of a_i s are missing. In this paper, we will find necessary conditions on the missing coefficients so that roots and critical points of $f(x)$ are integers. Also, we will provide the bound of total number of all possible missing coefficients whenever such missing coefficients exist. Finally we will provide an algorithm and a source code to search all possible missing coefficients.