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SOME RESULTS ON COMPOSITION OF THREE ENTIRE FUNCTIONS

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Abstract: The purpose of this paper is to study some growth properties of composition of three entire functions of finite $[p, q]$ order.

Keywords and Phrases: Order, iterated i-order, entire function, composition.

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1. Introduction and Definitions

Let f and g be two transcendental entire functions. It is well known by a result of Clunie [5] that $\lim\limits_{r\to\infty} \dfrac{T(r, f\circ g)}{T(r, f)} = \infty$ and $\lim\limits_{r\to\infty} \dfrac{T(r, f\circ g)}{T(r, g)} = \infty$. Many authors [3, 4, 5, 6, 8, 9, 10, 12, 13, 14, 18] have investigated the composition of entire functions with finite order and obtained many interesting results. In 2009, Tu et.al [16] investigated the growth of two composite entire functions of finite iterated order and proved several results connecting $T(r, fog)$, $T(r, f)$, $T(r, g)$.
After this in 2015, using the idea of generalised iteration of two entire functions Banerjee and Mandal [1, 2] extended the results of Jin tu et.al [16] for generalised iterated entire functions with finite iterated order. In this paper, we investigate the growth of composition of three entire functions to generalise the results of Xu et.al [17]. Here we use some basic definitions and standard notations of Nevanlinna theory [7]. First we introduce some basic definitions [11, 16, 17].

Definition 1.1. *Let $f(z)$ be an entire function. Then the order and lower order*