

# POLYNOMIAL IDENTITIES INVOLVING CENTRAL FACTORIAL NUMBERS

PETRO KOLOSOV

ABSTRACT. Central factorial numbers often appear in literature, for instance, in Riordan's "Combinatorial identities", D. E. Knuth's work entitled "Johann Faulhaber and Sums of Powers" and many others. In this manuscript, we start our discussion from definition of central factorial numbers (recursive and iterative), continuing with a set of identities used further in the manuscript. Then, based on odd power identities given by D. E. Knuth, we show other variations of these identities rewriting them applying derived previously identities in terms of central factorial numbers. Finally, we provide a comprehensive way to validate the results of the manuscript via supplementary Mathematica programs.

## CONTENTS

1. Introduction	1
2. Conclusions	1
References	2

## 1. INTRODUCTION

Your introduction here.

## 2. CONCLUSIONS

Conclusions of your manuscript.

---

*Date:* July 24, 2023.

2010 *Mathematics Subject Classification.* 26E70, 05A30.

*Key words and phrases.* Polynomials, Polynomial identities, Central factorial numbers, Central factorials, Binomial identities, Riordan Combinatorial identities, Falling factorials, Power sums, Faulhaber's formula .

## REFERENCES

**Version:** Local-0.1.0

*Email address:* kolosovp94@gmail.com

*URL:* <https://kolosovpetro.github.io>