

**A MANUAL OF  
LOGARITHMIC  
COMPUTATION: WITH  
NUMEROUS EXAMPLES**

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649467600

A Manual of Logarithmic Computation: With Numerous Examples by Alfred G. Compton

Except for use in any review, the reproduction or utilisation of this work in whole or in part in any form by any electronic, mechanical or other means, now known or hereafter invented, including xerography, photocopying and recording, or in any information storage or retrieval system, is forbidden without the permission of the publisher, Trieste Publishing Pty Ltd, PO Box 1576 Collingwood, Victoria 3066 Australia.

All rights reserved.

Edited by Trieste Publishing Pty Ltd.  
Cover @ 2017

This book is sold subject to the condition that it shall not, by way of trade or otherwise, be lent, re-sold, hired out, or otherwise circulated without the publisher's prior consent in any form or binding or cover other than that in which it is published and without a similar condition including this condition being imposed on the subsequent purchaser.

[www.triestepublishing.com](http://www.triestepublishing.com)

**ALFRED G. COMPTON**

**A MANUAL OF  
LOGARITHMIC  
COMPUTATION: WITH  
NUMEROUS EXAMPLES**



---

A MANUAL  
OF  
LOGARITHMIC COMPUTATION,

WITH NUMEROUS EXAMPLES.

BY

ALFRED G. COMPTON, A.M.,  
*Professor of Applied Mathematics in the College of the  
City of New York.*

---

NEW YORK:  
JOHN WILEY & SONS,  
15 ASTOR PLACE.  
1881.

COPYRIGHT,  
1881,  
By JOHN WILEY & SONS.

PRESS OF J. J. LITTLE & CO.,  
NO. 18 TO 20 ASTOR PLACE, NEW YORK.

RECEIVED

APR 30 2001

CABOT SCIENCE LIBRARY

## P R E F A C E .

---

THE objects of this Manual are—

First, to furnish to students full explanations of all the difficulties usually met with in the practice of computation by logarithms ;

Secondly, to set before them compact and orderly forms of arrangement of the computations ; and,

Thirdly, to provide instructors with an abundant collection of examples, progressively arranged, and covering all the points in regard to which mistakes are commonly made.

The Manual is the result of many years' experience of the difficulties met with in endeavoring to teach young students orderly and correct, as well as intelligent methods ; and whatever may be thought of the success with which these difficulties have been treated, it is believed that not many of them have been overlooked.

The rather elaborate subdivision of some of the topics in the third chapter results from actual experience of the perplexity occasioned in the minds

of even pretty good students by the varying signs which characteristic and mantissa and their multipliers assume in different problems.

It is strongly recommended that the teacher insist upon the pupil's following, in all written exercises, the form given in the last solved example under each head. Orderly arrangement is almost indispensable to correct and rapid work, and quite indispensable to that thorough revision by the teacher, without which written exercises are, for most pupils, of little value.



---

## CONTENTS.

---

### INTRODUCTION.

	PAGE
Definition and theory of logarithms, and construction of Tables. Principles of computation by logarithms.....	1

### CHAPTER I.

#### TO FIND THE LOGARITHM OF A NUMBER.

I. Number of <i>significant</i> figures not greater than four.	
1. Whole number.	
<i>a.</i> Less than 100.....	8
<i>b.</i> Between 100 and 10,000.....	8
<i>c.</i> Greater than 10,000.....	10
2. Mixed number.....	11
3. Fraction (decimal).....	13
II. Number of significant figures greater than four. Interpolation.	
1. Whole number.....	13
2. Mixed number or fraction.....	18

### CHAPTER II.

#### TO FIND THE NUMBER CORRESPONDING TO A GIVEN LOGARITHM.

I. The logarithm being found in the table.....	20
II. The logarithm not being found in the table. Interpolation	21

## CHAPTER III.

## ARITHMETICAL OPERATIONS BY MEANS OF LOGARITHMS.

<b>I. MULTIPLICATION.</b>	
1. Both factors positive.	PAGE
<i>a.</i> Both entire.....	26
<i>b.</i> One or both mixed.....	30
<i>c.</i> One or both fractional.....	30
2. One or both negative.....	32
3. More than two factors.....	33
<b>II. DIVISION.</b>	
1. Both terms positive.	
<i>a.</i> Both greater than unity.	
(1.) Integers in the dividend more, and figures larger than in the divisor.....	34
Arithmetical complement.....	34
(2.) Integers in the dividend more, but figures smaller than in the divisor.....	36
(3.) Integers in the dividend fewer, and figures smaller than in the divisor.....	37
<i>b.</i> Either or both less than unity.	
(1.) Figures in the dividend larger than those in the divisor.....	38
(2.) Figures in the dividend smaller than those in the divisor.....	40
2. Either or both negative.....	41
<b>III. MULTIPLICATION AND DIVISION.</b>	
Multiplication and Division.....	43
<b>IV. INVOLUTION.</b>	
1. Number positive.	
<i>a.</i> Whole or mixed.	
(1.) Exponent positive.....	44
(2.) Exponent negative.....	45
<i>b.</i> Fraction.	
(1.) Exponent positive.....	47
(2.) Exponent negative.....	47

CONTENTS.

vii

2. Number negative.	
a. Whole or mixed.	PAGE
(1.) Exponent positive.....	49
(2.) Exponent negative.....	49
b. Fraction .....	50
V. EVOLUTION.	
1. Number positive.	
a. Whole or mixed.	
(1.) Exponent positive.....	51
(2.) Exponent negative.....	52
b. Fraction.	
(1.) Exponent positive.....	53
(2.) Exponent negative.....	54
2. Number negative.....	55
VI. INVOLUTION AND EVOLUTION.	
I. Number positive.	
1. Exponent positive.	
a. Number whole or mixed.	
(1.) Numerator and denominator of exponent	
both whole.....	57
(2.) Numerator mixed or fractional.....	58
(3.) Denominator or both terms of exponent	
mixed or fractional.....	61
b. Number fractional.	
(1.) Both terms of exponent whole.....	62
(2.) Numerator of exponent mixed or fractional.	65
(3.) Denominator or both terms of exponent	
mixed or fractional.....	66
2. Exponent negative.....	67
II. Number negative.....	69
VII. EXPONENTIAL EQUATIONS. ( $a^x = b$ .)	
I. $a$ and $b$ both whole or mixed.	
1. $a < b$ .....	69
2. $a > b$ .....	70

UNIVERSITY OF TORONTO LIBRARY