

**KEY TO THE PROGRESSIVE PRACTICAL
ARITHMETIC: INCLUDING ANALYSES
OF THE MISCELLANEOUS EXAMPLES
IN THE PROGRESSIVE INTELLECTUAL
ARITHMETIC: FOR TEACHERS ONLY**

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Key to the Progressive practical arithmetic: including analyses of the miscellaneous examples in the Progressive intellectual arithmetic: for teachers only by Horatio N. Robinson

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HORATIO N. ROBINSON

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ARITHMETIC: INCLUDING ANALYSES
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IN THE PROGRESSIVE INTELLECTUAL
ARITHMETIC: FOR TEACHERS ONLY**

K E Y
TO THE
P R O G R E S S I V E
P R A C T I C A L A R I T H M E T I C,

INCLUDING

ANALYSES OF THE MISCELLANEOUS EXAMPLES

IN THE

PROGRESSIVE INTELLECTUAL ARITHMETIC.

FOR TEACHERS ONLY.



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P R E F A C E .

A **KEY** to any Mathematical work is not intended to supersede labor and study, but to give direction to the latter and make it more effective and useful.

In many examples and problems the same results may be obtained by different processes, but the shortest and most simple method is to be desired; hence the object of a **Key** should be to give not results only, but the explanation of methods, and a full analysis of such questions as contain a peculiar application of principles involved.

It is supposed, of course, that every teacher is fully competent to solve all the questions, but with the multiplicity of duties ordinarily put upon the teacher, time cannot always be had to answer or solve all the questions presented by the pupil. Therefore the **Key** is intended to lessen the labor, and save the time of the teacher by presenting the shortest solution, and the best form of analysis as a standard to which the pupil should be required to conform.

In compliance with the wishes of many teachers, brief analyses of the Miscellaneous Examples in the Intellectual Arithmetic have been added to the latter part of this work.

Much labor has been bestowed upon the present work to give a full, complete, and logical analysis of all difficult examples, and of such questions as contain the application of a new principle. The arrangement is such as to be easily understood.

K E Y .

NOTATION.

ROMAN NOTATION.

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Ex. 1. <i>Ans.</i> XI.	Ex. 2. <i>Ans.</i> XV.
Ex. 3. <i>Ans.</i> XXV.	Ex. 4. <i>Ans.</i> XXXIX.
Ex. 5. <i>Ans.</i> XLVIII.	Ex. 6. <i>Ans.</i> LXXVII.
Ex. 7. <i>Ans.</i> CLIX.	Ex. 8. <i>Ans.</i> DXCIV.
Ex. 9. <i>Ans.</i> MDXXXVIII.	Ex. 10. <i>Ans.</i> MDCCCX.

ARABIC NOTATION.

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Ex. 1. <i>Ans.</i> 125.	Ex. 2. <i>Ans.</i> 483.	Ex. 3. <i>Ans.</i> 716.
Ex. 4. <i>Ans.</i> 900.	Ex. 5. <i>Ans.</i> 290.	Ex. 6. <i>Ans.</i> 809.
Ex. 7. <i>Ans.</i> 505.	Ex. 8. <i>Ans.</i> 557.	

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Ex. -1. <i>Ans.</i> 1200.	Ex. 2. <i>Ans.</i> 5160.	Ex. 3. <i>Ans.</i> 3741.
Ex. 4. <i>Ans.</i> 8050.	Ex. 5. <i>Ans.</i> 2090.	Ex. 6. <i>Ans.</i> 7009.
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Ex. 11. *Ans.* Seventy-six; one hundred twenty-eight; four hundred five; nine hundred ten; one hundred sixteen; three thousand four hundred sixteen; one thousand twenty-five.

Ex. 12. *Ans.* Two thousand one hundred; five thousand forty-seven; seven thousand nine; four thousand six hundred

seventy; three thousand nine hundred ninety seven; one thousand one.

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Ex. 18. *Ans.* Five thousand six; twelve thousand three hundred four; ninety-six thousand seventy-one; five thousand four hundred seventy; two hundred three thousand four hundred ten.

Ex. 19. *Ans.* Thirty-six thousand seven hundred forty-one; four hundred thousand five hundred sixty; thirteen thousand sixty-one; forty-nine thousand; one hundred thousand ten.

Ex. 20. *Ans.* Two hundred thousand two hundred; seventy five thousand six hundred twenty; ninety thousand four hundred two; two hundred eighteen thousand ninety-four; one hundred thousand one hundred one.

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- Ex. 9. *Ans.* 900090. Ex. 10. *Ans.* 10011010.
 Ex. 11. *Ans.* 61005000000. Ex. 12. *Ans.* 5080009000001.
 Ex. 13. *Ans.* Eight thousand two hundred forty.
 Ex. 14. *Ans.* Four hundred thousand nine hundred.
 Ex. 15. *Ans.* Three hundred eight.
 Ex. 16. *Ans.* Sixty thousand seven hundred twenty.
 Ex. 17. *Ans.* One thousand ten.
 Ex. 18. *Ans.* Fifty-seven million four hundred sixty-eight thousand one hundred thirty-nine.
 Ex. 19. *Ans.* Five thousand six hundred twenty-eight.
 Ex. 20. *Ans.* Eight hundred fifty million twenty-six thousand eight hundred.
 Ex. 21. *Ans.* Three hundred seventy thousand five.
 Ex. 22. *Ans.* Nine billion four hundred million seven hundred six thousand three hundred forty-two.
 Ex. 23. *Ans.* Thirty-eight million four hundred twenty-nine thousand five hundred twenty-six.
 Ex. 24. *Ans.* Seventy-four billion two hundred sixty-eight million one hundred thirteen thousand seven hundred fifty-nine.
 Ex. 25. *Ans.* 7000036.
 Ex. 26. *Ans.* 563004.
 Ex. 27. *Ans.* 1096000.
 Ex. 28. *Ans.* Nine billion four million eighty-two thousand five hundred one.
 Ex. 29. *Ans.* Two trillion five hundred eighty-four billion five hundred three million nine hundred sixty-two thousand forty-seven.
 Ex. 30. *Ans.* 3064152.
 Ex. 31. *Ans.* Two of the sixth order, 9 of the fifth, 6 of the third, 4 of the second, and 8 of the first.
 Ex. 32. *Ans.* One of the seventh order, 3 of the fifth order, 7 of the fourth order, and 5 of the second order.