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Project: Number Theory Application: Check Digits for International Standard

Book Numbers (ISBNs)

Book Title: Book 1 Principles of Mathematics

Copyright Year, Edition, and ISBNs: ©2015 Student Edition.

ISBN-10: 0890518750

ISBN-13: 9780890518755

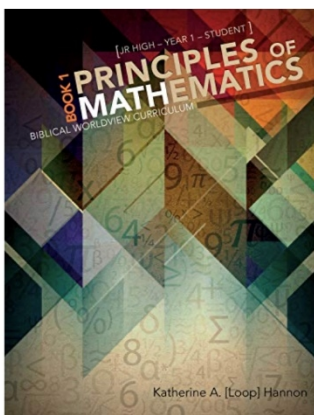
Objectives: (1.) Verify the check digit for ISBN-10

(2.) Verify the check digit for ISBN-13

(3.) Convert ISBN-10 to ISBN-13

(4.) Convert ISBN-13 to ISBN-10

Calculations:



Softcover

ISBN 10: 0890518750 /
ISBN 13: 9780890518755
Publisher: Master Books, 2015

12 New
from
US\$ 29.7

18 Used
from US\$ 5.0

1st Objective:

Given: 089051875-?

To Calculate: The check digit

1st Approach: Multiplication-Modulo Approach

$$0 \cdot 1 = 0$$

$$8 \cdot 2 = 16$$

$$9 \cdot 3 = 27$$

$$0 \cdot 4 = 0$$

$$5 \cdot 5 = 25$$

$$1 \cdot 6 = 6$$

$$8 \cdot 7 = 56$$

$$7 \cdot 8 = 56$$

$$5 \cdot 9 = 45$$

$$\Sigma \text{ Products} = 231$$

$$\text{Remainder} = 231 \text{ mod } 11 = 0$$

ISBN-10: 0890518750 (modulo 11)

2nd Objective:

Given: 97809051875-?

To Calculate: The check digit

Approach: Multiplication-Modulo-Subtraction

$$9 \cdot 1 = 9$$

$$7 \cdot 3 = 21$$

$$8 \cdot 1 = 8$$

$$0 \cdot 3 = 0$$

$$8 \cdot 1 = 8$$

$$9 \cdot 3 = 27$$

$$0 \cdot 1 = 0$$

$$5 \cdot 3 = 15$$

$$1 \cdot 1 = 1$$

$$8 \cdot 3 = 24$$

$$7 \cdot 1 = 7$$

$$5 \cdot 3 = 15$$

$$\Sigma \text{Prodcuts} = 135$$

$$\text{Remainder} = 135 \text{ mod } 10 = 5$$

$$\text{Check digit} = \text{Modulo} - \text{Remainder}$$

$$= 10 - 5$$

$$= 5$$

ISBN-13: 978090518755 (modulo 10)

3rd Objective:

Given: ISBN-10: 0890518750

To Convert: to ISBN-13

Remove the check digit, 0: we have:

089051875

Now we replace it with the check digit for ISBN-13: we have:

0890518755

Then I add 978 in front which gives us:

9780890518755

∴ ISBN-13 is 9780890518755

4th Objective:

Given: ISBN-13: 9780890518755

To Convert: to ISBN-10

Remove the check digit, 5: we have:

978089051875

Now we replace it with the check digit for ISBN-10 we have:

9780890518750

Then we remove the number: 978 from the front of the remaining digits: we have:

0890518750

∴ ISBN-10 is 0890518750

References: APA Style

Chukwuemeka, S. D. (2023). *Mathematics Education Courses*. Retrieved from

<https://Mathematicseducation.appspot.com>

Loop K. A. (2015). *Principles of mathematics: biblical worldview curriculum : book 1*. Master Books.