

LESSON 3

- WORDS
 - Introduction to Abbreviations
 - Single-Word Switch Indicator
- LETTERS
 - Introduction to the English-Letter Indicator
 - Mathematical Letter Combinations

Format

- Keep Together
- FORMAT SUMMARY #2

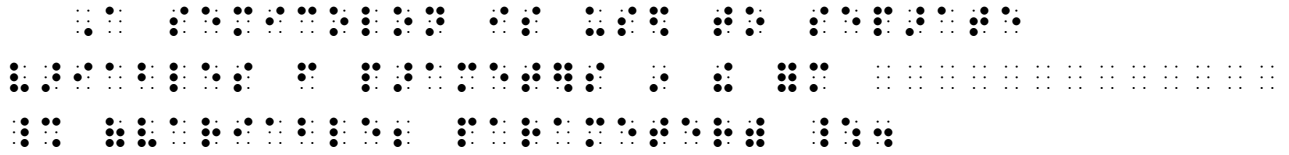
Answers to Practice Material

LESSON PREVIEW

Transcription of words in mathematical context requires a close look at punctuation, capitalization, and nonuse of contractions. Abbreviations require special treatment. A single narrative word may be transcribed within the code switches by using a single-word switch indicator. Code switching at page turns is examined. "Single letters" in Nemeth are defined, and the English-letter indicator is introduced.

Example 3-11

A semicolon is used to separate variables from parameters in the form (variable; parameter).



The semicolon does not require a punctuation indicator because words are punctuated in literary mode, even in mathematical context.

PRACTICE 3A

- A. If 1 pound of Swiss cheese costs \$2.50, how much does 4.8 pounds cost?
- B. JMHS's set of high-jump champions: {Terry, Leslie, Traci}
- C. The parts of a subtraction problem are named as follows: minuend – subtrahend = difference.
- D. Did you know that 98.6 degrees Fahrenheit is not necessarily "normal" body temperature for everyone?

Only the decimal number and its associated abbreviation are transcribed in Nemeth.

PRACTICE 3B

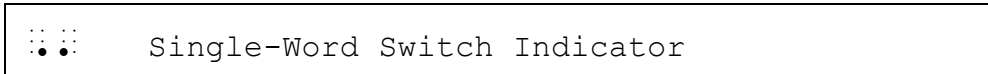
1. If 1 lb. of Gouda cheese costs \$2.96, what will you pay for 2.5 lbs.?
 2. If 2kg Gruyère costs £2,65, what is the cost of a wheel weighing 3kg?
 3. Continuing the set of ordinals, fifth = 5th, sixth = 6th, seventh = 7th, eighth = 8th.
 4. 1 kcal is equivalent to 3088.03 ft.lb.
 5. The QE2 had a top speed of 32.5 knots.
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More To Come This does not complete the discussion of abbreviations in mathematical context. Single-letter abbreviations, abbreviations that use the same letters as a shortform, and further spacing rules within mathematical expressions will be discussed in Lesson 4.

Single-Word Switch Indicator

3.7 The Single-Word Switch Indicator

Words that do not provide mathematical meaning are transcribed in UEB. When a single word occurs between two math expressions, the single-word switch indicator is used to indicate that the following word is in UEB.

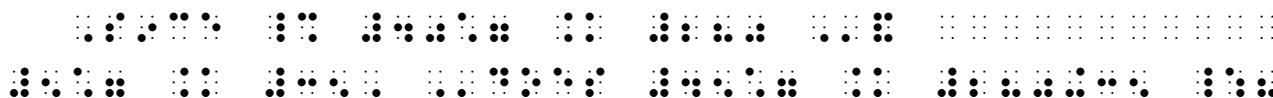


Until this symbol becomes widely recognized, we suggest that the single-word switch indicator be listed on the Special Symbols page. See the Final Lesson for details.

3.7.1 Spacing and Contractions. The single-word switch indicator is unspaced from the word. Contractions are used according to the rules of UEB. The switch is required on a single word even if the word contains no contractions. The effect of the single-word switch indicator is terminated by a space, and Nemeth resumes.

Example 3-29

Since $40 \cdot 7 = 280$ and $5 \cdot 7 = 35$, does $45 \cdot 7 = 280 + 35$?

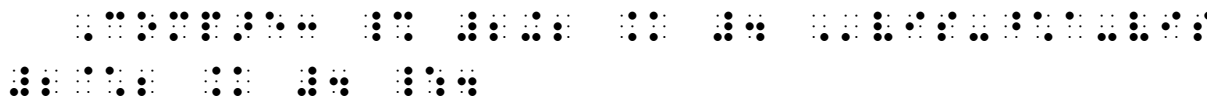


The words are part of the sentence structure—they are not being used mathematically—and so UEB applies.

3.7.2 With a Hyphenated Compound Word. The single-word switch indicator can be used with a hyphenated compound UEB word that comes between Nemeth items.

Example 3-30

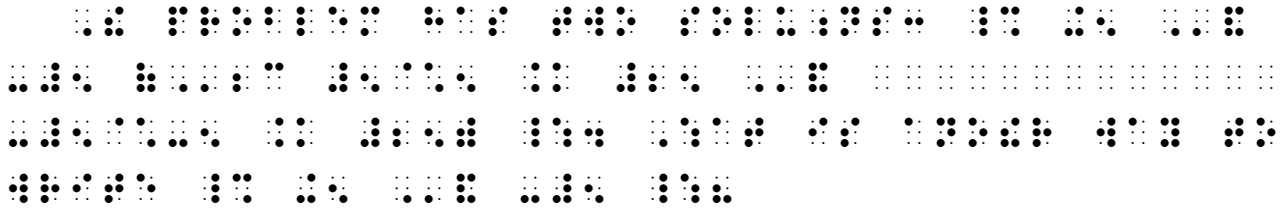
Compare: $2 + 2 = 4$ vis-à-vis $2 \times 2 = 4$.



The hyphenated compound word vis-à-vis is considered to be one word. The acute accent follows UEB rules for modified letters.

Example 3-38

The problem has two solutions: +5 and -5 (because $5 \times 5 = 25$ and $-5 \times -5 = 25$). What is another way to write +5 and -5?

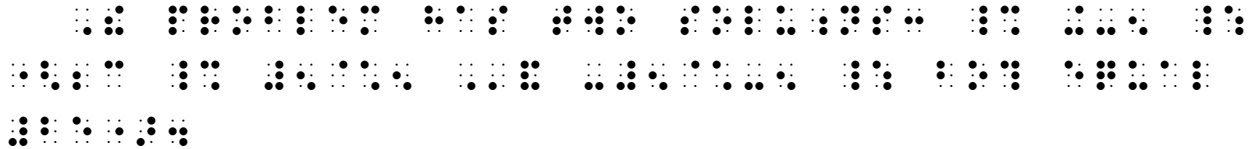


The opening and closing parentheses are in Nemeth. The single-word switch indicator immediately follows the opening parenthesis.

Example 3-39

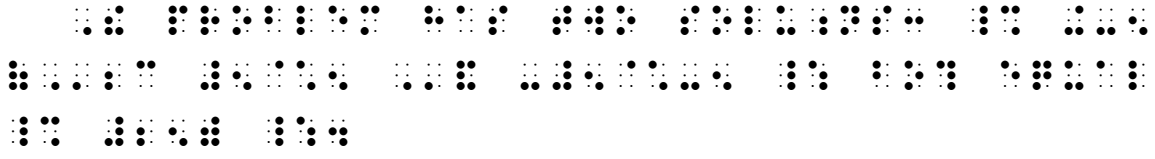
The problem has two solutions: ± 5 (because 5×5 and -5×-5 both equal 25).

Transcription A.



The closing parenthesis is in UEB. The opening parenthesis must also be in UEB. Because a single-word switch indicator cannot be used immediately before an opening parenthesis, Nemeth is terminated and then reopened after the word.

Transcription B.

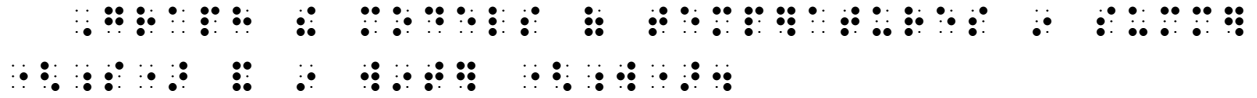


By transcribing the numeral 25 and the closing parenthesis in Nemeth, the opening parenthesis is now done in Nemeth, similar to Example 3-38.

3.7.9 **The Word "of"**. The word "of" requires a closer look. Within a narrative sentence, it is a word like any other word and may require a single-word switch indicator. However, when "of" is part of an equation, it is transcribed in Nemeth, uncontracted, without any code switching. Compare the treatment of the word "of" in these examples.

Example 3-52

Graph the models of temperatures in summer (s) and in winter (w).



The unmodified letters s and w, transcribed in UEB, are touching punctuation.

Example 3-53

The dependent variables belong on the y-axis.



The letter y is unmodified. The hyphenated term is transcribed in UEB.

Example 3-54

Find the nth term of the arithmetic sequence.



The letter n is unmodified. The ordinal is transcribed in UEB.

3.11 Single English Letters in Nemeth Code

When an English letter that has mathematical meaning appears in technical context—that is, between Nemeth switches—it is transcribed according to the rules of the Nemeth Code. Before presenting the rules, it is helpful to understand how the Nemeth Code defines a "single letter".

3.11.1 **Nemeth Definition of "Single Letter"**. Throughout this course, when referring to the Nemeth Code's definition of a single letter, the term "single letter" is in quotation marks. To be defined as a "single letter" in Nemeth, several criteria must be met.

- i. A "single letter" must be from the English alphabet, transcribed in regular type, and unmodified as defined in Section [3.10](#).

These are "single letters" p D z R

These are not "single letters" π D \bar{z} ℝ

The first letter is not from the English alphabet, the second and fourth letters are not in regular type, the third letter is modified with a bar over it.

- ii. Furthermore, in the print copy the letter must be both preceded by a space or by one or more punctuation marks and followed by a space or by one or more punctuation marks.*

These are "single letters" "y" x, "w S"

Each letter is preceded and followed by punctuation or by a space.

These are not "single letters" -x "wS" y+z

The x, z, and S are not preceded by a space or by punctuation (-x is "negative x"); the y and the w are not followed by a space or by punctuation.

- iii. Whether the leading punctuation mark is preceded by a space or not is irrelevant; whether the following punctuation mark is followed by a space or not is irrelevant.

These are "single letters" "x"+"y"

Each letter is both preceded and followed by punctuation.

- iv. If the space shown in print is not shown in braille, the letter is no longer a "single letter."

These are not "single letters" r + s

Although each letter is preceded and followed by a space in print, in braille the plus sign is unspaced from the letters.

- v. And finally, to be defined as a "single letter" the letter must not be an abbreviation nor can it be a word ("a", "A", "I", or "O").

These are not "single letters" I need 4.5 m of fabric.

I is a word; m is an abbreviation for meters.

*Nemeth grouping symbols, such as parentheses, are not considered to be punctuation marks. Rules for letters touching grouping symbols will be discussed in Lesson 4.

Introduction to the English-Letter Indicator

The term "English-letter indicator" clearly describes the function of this indicator—that is, the following letter (singular) is from the English alphabet.

⠄ English-Letter Indicator

It is important to note that the English-letter indicator does not function in the same way as the UEB grade 1 symbol indicator. Several rules are in place regarding situations where the English-letter indicator is or is not used.

3.12 Use of the English-Letter Indicator with a "Single Letter"

Even though contractions are not used in Nemeth, a single letter from the English alphabet used in mathematical context may require an English-letter indicator for clarity. Except as noted in [3.13](#), an English-letter indicator is required when a letter is a "single letter" as defined in [3.11.1](#).

3.12.1 Capitalization of "Single Letters". To indicate a single capitalized letter, the capitalization indicator is placed between the English-letter indicator and the letter. The effect of the capitalization indicator extends only to the letter which follows it.

⠄ Capitalization Indicator

➤ D ⠄⠄⠄

3.12.2 Punctuation of "Single Letters". A "single letter" is punctuated mathematically if the letter and the punctuation fall within the Nemeth switch indicators.

The examples from [3.11.1](#) are illustrated below, assuming mathematical context. Note the placement of the capitalization indicator as well as the use of mathematical punctuation.

Example 3-55

p D z R x, "y" "w S" "x"+"y"

⠄⠄ ⠄⠄ ⠄⠄⠄ ⠄⠄ ⠄⠄⠄⠄ ⠄⠄⠄ ⠄⠄⠄⠄⠄⠄ ⠄⠄⠄ ⠄⠄⠄⠄⠄⠄ ⠄⠄⠄⠄
⠄⠄⠄⠄⠄⠄⠄⠄⠄⠄⠄⠄⠄⠄ ⠄⠄

Instructions: Demonstrate use of the English-letter indicator and proper punctuation mode in this series of single letters. Transcribe entirely in Nemeth, using [Example 3-55](#) as a model.

PRACTICE 3D

c, C; r, R; "l", "L"; "i, j, k"; "l"×"w"×"h".

3.14 Letters as Identifiers

Letters used as identifiers are constructed according to the rules of the code which is in effect at the time—UEB or Nemeth. Compare:

Print	UEB	Nemeth
a.	⠠⠁	⠠⠠⠁
B.	⠠⠠⠠⠠⠠⠠⠠⠠	⠠⠠⠠⠠⠠⠠⠠⠠
(a)	⠠⠠⠠⠠⠠⠠⠠⠠	⠠⠠⠠⠠
(B)	⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠	⠠⠠⠠⠠⠠⠠
c)	⠠⠠⠠⠠⠠⠠	⠠⠠⠠⠠

Instructions: Demonstrate the use and the nonuse of the English-letter indicator for "single letters" by transcribing this practice entirely in Nemeth. Place the opening Nemeth Code indicator in cell 1 on the first line. Begin item (a) on the next line. Place the Nemeth Code terminator at the end of the last item, on the same line.

PRACTICE 3E

- (a) $r = \text{rate}$
- (b) $"r" = \text{rate}$
- (c) $x, y, z < 100$
- (d) $n\text{¢} = \$4.95$
- (e) $x > "3"$
- (f) $a + b$
- (g) $|y| = |-y|$
- (h) $|x + y| = |x| + |y|$
- (i) $P(\text{red and blue})$

Instructions: Explain your decisions regarding use and nonuse of the English-letter indicator.

PRACTICE 3F

- (A) Prove: If $a < b$ and $c < 0$, then $ac > bc$. Verify your proof by determining ac and bc when $a = 5$, $b = 7$, and $c = -4$.
- (B) $j = 1, 2, \dots, n$
- (C) 40% of $N = 120$
- (D) 40% of "N" = 120
- (E) If "rcv = rjc" does "v" = "j"?

FORMAT SUMMARY #2

Here is a summary of the Nemeth formats encountered in Lessons 2 and 3.

Side-by-Side Itemized Material When itemized material is arranged side by side across the page in print, the braille format is changed so that all identifiers start in cell 1. (Different rules apply to subitems and to spatial material, which will be studied later.)

Keep Together—Hyphenated Expressions A hyphenated expression containing one or more mathematical components must not be divided between braille lines.

Keep Together—Mathematical Expression If a page number on line 25 or line 1 does not allow the entire mathematical expression to fit on the line, the expression must be brought down to the next line that has enough usable cells. If the expression will fit on one line but the code switch indicators will not, one or both of the indicators can be placed on a different line.

Keep Together—Abbreviation An abbreviation and a preceding or following numeral to which it applies must not be divided between braille lines.

For further practice, see Appendix A—Reading Practice.

EXERCISE 3

Prepare Exercise 3 for your grader

