























..OR..

In this final example, there is more than one expression between the code switches. Each expression is kept together on one braille line but there is no need to force the switches to be on the same page. There is no need to restate "Nemeth Code" at the page turn.

*Example 4.7-4* Find the volume of a rectangular prism with length = 2 ft, width = 4 ft, and height = 3 ft.

*Each of the three expressions must not be allowed to wrap before or after the equals sign or between the numeral and the abbreviation "ft". The first two occurrences of the abbreviation "ft" do not have a related period so you must assume that the period following the third occurrence does not relate to the abbreviation; it only ends the sentence and so is brailled after the Nemeth Code terminator.*

*Instructions:* In the first paragraph, assume there is a braille page turn after the word "to". Use braille page number "55" and print page number "a44" on line 1 of the new braille page.

### PRACTICE 4C

A unit of work is the foot-pound (ft-lb). One foot-pound converts to 12.000000427771 inch-pounds. How many in-lb is 4.6 ft-lb? How many ft-lb is 247.9927443 in-lb?

If 1 joule = 10 million ergs, and 1 megajoule = 1,000,000 joules, how many ergs is 1 megajoule? 1 megajoule = ? ergs



**4.10.1 Nemeth Code Definition of "Single Letter":** To be defined as a "single letter" in the Nemeth Code several criteria must be met.

- i. A "single letter" must be from the English alphabet, in regular type, and unmodified.

These are "single letters"      p D z R

These are not "single letters"       $\pi$  D  $\bar{z}$   $\mathbb{R}$       *The first letter is not from the English alphabet, the second and fourth letters are not in regular type, the third letter is modified.*

- o SPECIAL CASE: A letter representing a mathematical variable is often printed in italics but the italics are disregarded in braille. **Lesson 7** discusses typeform.

- 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"      *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.*

- o *Note:* Nemeth Code grouping symbols are not considered to be punctuation marks. Rules for letters touching grouping symbols are discussed later.

- 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".*

Single-letter abbreviations are discussed in a later lesson.

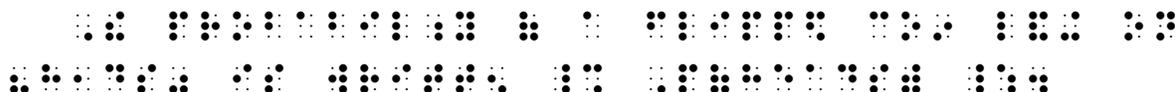
Throughout this course, when referring to the Nemeth Code definition of a single letter, the term "single letter" is in quotation marks.







Example 4.12-8 The probability of a flipped coin landing on "heads" is written P(heads).



**4.13 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 Code. Compare:

<u>Print</u>	<u>UEB</u>	<u>Nemeth Code</u>
a.		
B.		
(a)		
(B)		
c)		

*Instructions:* Demonstrate the use and the nonuse of the English letter indicator for "single letters" by brailleing this practice entirely in Nemeth Code. To keep the identifiers beginning in the proper cell, braille an opening Nemeth Code indicator in cell 1 on the first line and begin the first item on the next line.

### PRACTICE 4E

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



Example 4.15-2 Liken QR vis-à-vis PS.



**4.16 Shortform Letter Combinations:** If the mathematical letter sequence corresponds to a shortform of UEB, further rules apply. To be a "shortform letter combination" in mathematical context the letters must correspond to a shortform of UEB, must not represent a word or an abbreviation, and all of its letters must be lowercase.

These are "shortform letter combinations"      ab ac dcl

These are not "shortform letter combinations"      Ab ad DCL

*Abbreviations that use the same letters as a shortform are discussed in a later lesson.*

Rules regarding the use or nonuse of the ELI with a "shortform letter combination" are similar to the rules which apply to "single letters".

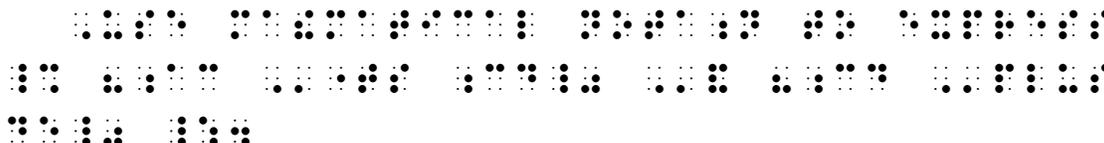
**4.16.1 Use of the English Letter Indicator with a "Shortform Letter Combination":**

The ELI is used when a shortform letter combination ...

- i. is in regular type;
- ii. is unmodified;
- iii. is preceded by a space or by one or more punctuation marks AND followed by a space or by one or more punctuation marks. Nemeth grouping symbols are not punctuation marks.

The effect of the indicator extends to the entire shortform following it.

Example 4.16-1 Use mathematical notation to express "ac times cd" and "cd plus de".



*Two-letter combinations must be brailled in Nemeth Code, but only those letter combinations that are the same as a shortform require an ELI. Mathematical punctuation is used.*

**4.16.1.a Ordinals:** The Nemeth Code rules regarding the use of the ELI are followed when an ordinal ending is present. If an ELI is required without the ordinal ending, it is still necessary. A switch to Nemeth Code is required because of the two-letter mathematical items.

Example 4.16-2 Mark the abth and jkth columns.



*Only the letter combination that is the same as a shortform requires an ELI.*



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*Instructions:* These examples illustrate both use and nonuse of the English letter indicator with a "single letter" or a "shortform letter combination". Explain your decisions.

### PRACTICE 4F

- (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"?

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### FORMAT SUMMARY #2

Here is a summary of the Nemeth Code formats encountered in Lessons 3 and 4.

**Side-by-Side Items in Itemized Material with No Subdivisions:** When unsubdivided itemized material is arranged side by side across the page in print, the braille format must be changed so that all identifiers start in cell 1.

**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.*









