LESSON 2

LESSON PREVIEW

The punctuation indicator is introduced as we take a closer look at punctuation inside the switches. Summaries are given regarding the use/nonuse of the punctuation indicator. Nemeth grouping symbols are introduced. Code switching within numbered/lettered formats is discussed. Nemeth rules regarding hyphenated expressions are given. An alternate layout option for itemized material is considered.

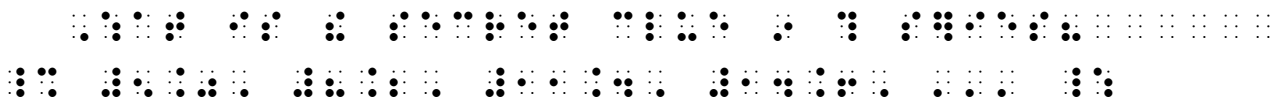
MORE ABOUT PUNCTUATION

2.1 Punctuation Mode

Punctuation mode is determined by whether the punctuation occurs inside or outside of the Nemeth switches. The concept is simple – punctuation that occurs outside of the switch indicators is transcribed in "literary mode" according to the rules of Unified English Braille; punctuation occurring within the switch indicators is transcribed in "mathematical mode" according to the rules of the Nemeth Code. Take another look at this example from Lesson 1, noting that UEB punctuation is used for the question mark and the Nemeth comma and ellipsis are used in the mathematical portion.

Example 2-1

What is the secret clue in this series? 5.0, 8.2, 11.4, 14.6, ...



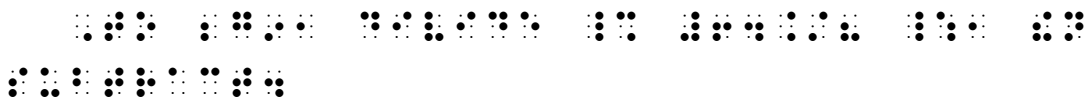
The mathematical comma is dot 6. Switch Decision: The ellipsis indicates that the mathematical series continues and so is transcribed in Nemeth. The mathematical ellipsis is dots (3, 3, 3).

2.2 Spacing of UEB Punctuation and Code Switch Indicators

As shown in Lesson 1, punctuation that relates to the main text is placed outside of the switch indicators when the surrounding text is in UEB. There is no space between the terminator and the following punctuation unless the following punctuation is a spaced dash.

Example 2-2

To begin, divide 64 ÷ 8, then subtract.



Note the use of the literary comma (dot 2) outside of the Nemeth Code terminator.

Example 2-3

Divide 64 ÷ 8—then subtract.

The unspaced dash is part of the sentence punctuation and is placed outside of the Nemeth Code terminator.

Example 2-4

Divide 64 ÷ 8 — then subtract.

The spaced dash is part of the sentence punctuation and is placed outside of the Nemeth Code terminator. A space precedes and follows the dash, as printed; the space before the Nemeth Code terminator does not represent a space in print.

Example 2-5

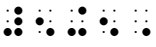
We continue ... $8 - 14 = -6$

The ellipsis is part of the sentence punctuation and is placed outside of the opening Nemeth Code indicator. A space precedes and follows the ellipsis, as printed. The space after the opening Nemeth Code indicator does not represent a space in print.

2.3 Nemeth Punctuation

When punctuation occurs within mathematical material, excessive code switching is avoided by using Nemeth punctuation. In the sample below, the Nemeth comma (dot 6) is used within the series even though the comma itself is not mathematical.

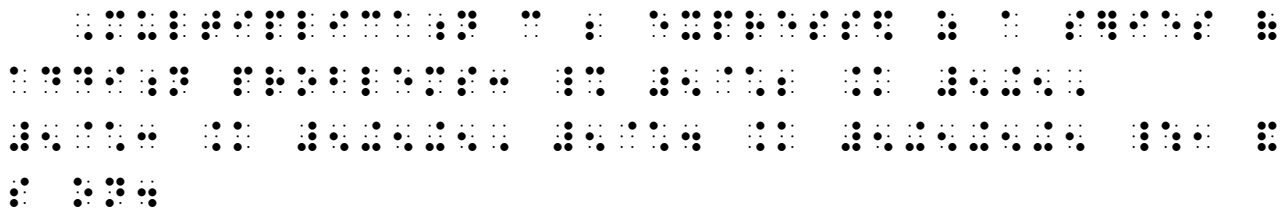
⋙ 5+5,



Example 2-6

Multiplication can be expressed as a series of addition problems: $5 \times 2 = 5 + 5$, $5 \times 3 = 5 + 5 + 5$, $5 \times 4 = 5 + 5 + 5 + 5$, and so on.

1
2
3
4



Line 3: The last comma is placed outside of the switch, as a dot 2 literary comma, because UEB text follows.

Instructions: Consider carefully where to place the code switch indicators and what kind of punctuation to use in these three sentences. Apply 3-1 Nemeth paragraphing.

PRACTICE 2A

72813654, when written as 72 81 36 54, is obviously divisible by 9.

Write these numbers: 3.29, 500, −123, 2,000.88, −250,794. Now add them together.

Is the answer 4.0‰, or is it 4.0%?

PUNCTUATION IN NEMETH CODE

2.4 Background

So far we have looked at punctuation that is unambiguous in mathematical context: the mathematical comma and the short dash. These symbols are different from their UEB counterparts.

⠸⠂ Mathematical comma

⠸⠤⠤ Short dash

When other punctuation marks are transcribed inside the Nemeth switches, the punctuation symbols from UEB are used: the apostrophe, colon, exclamation point, period, question mark, quotation marks, and semicolon. (*Note:* Only the one-cell "double" quotation marks ⠘⠦ ⠘⠴ and the two-cell "single" quotation marks ⠠⠘⠦ ⠠⠘⠴ are used inside the Nemeth switches.) When a punctuation mark is not preceded by a space, clarification is required because the symbols are formed with the same braille dots as Nemeth numerals and symbols, as demonstrated in this list.

A semicolon ⠰⠆ could be misread in Nemeth as the numeral 2.
A colon ⠒ could be misread in Nemeth as the numeral 3.
A period ⠲ could be misread in Nemeth as the numeral 4.
An exclamation point ⠖ could be misread in Nemeth as the numeral 6.
A question mark ⠦ could be misread in Nemeth as the numeral 8.
A closing "double" quotation mark ⠴ could be misread in Nemeth as the numeral 0.
A closing "single" quotation mark ⠠⠴ could be misread in Nemeth as a comma and the numeral 0.
An apostrophe ⠄ could be misread in Nemeth as a prime sign.

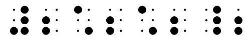
Clarification is achieved by use of the *punctuation indicator*.

The Punctuation Indicator

2.5 Role of the Punctuation Indicator

A punctuation indicator is placed before one or more of the punctuation marks listed in the box on the previous page when such punctuation is not preceded by a space. (A punctuation indicator is not used at the beginning of a braille line or after a space.) Use of the punctuation indicator assures that the braille is read as punctuation and is not misread as a mathematical symbol.

⠰⠆ Punctuation Indicator

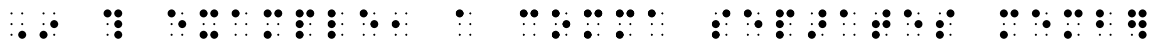
⫸ 2 · 2 · 2; 

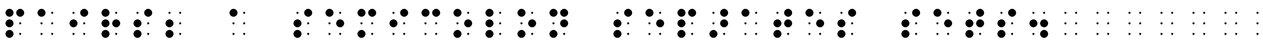
The punctuation indicator prevents the semicolon from being misread as the numeral 2.

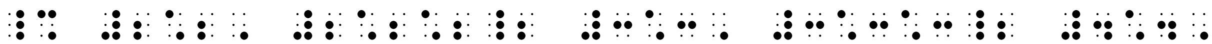
Exceptions occur for punctuated words and abbreviations. This will be covered in Lesson 3.

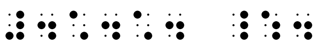
Example 2-7

In this example, a comma separates member pairs; a semicolon separates sets. 2 · 2, 2 · 2 · 2; 3 · 3, 3 · 3 · 3; 4 · 4, 4 · 4 · 4.

1 

2 

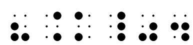
3 

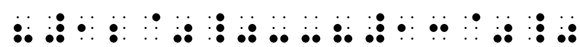
4 

Line 3: Although the opening Nemeth Code indicator will fit on line 2, the first math expression will not. Within a paragraph, keep each switch indicator on the same line as the mathematics to which it applies, if it will fit, so the opening switch starts line 3.

Line 4: The final period applies to the entire sentence. It is placed <u>after</u> the Nemeth Code terminator.

2.5.1 **Two or More Punctuation Marks in a Row.** When two or more punctuation marks follow a mathematical item, only one punctuation indicator is used.

⫸ "=". 

⫸ "12%"—"13%" 

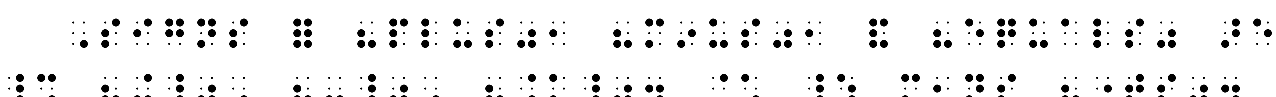
Recall from Section 1.7.3 in Lesson 1 that a numeric indicator is required following a dash even though that number may not be preceded by a space.

a. If a comma is the second punctuation mark, the mathematical comma is transcribed.

⫸ "−", 

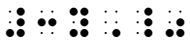
Example 2-8

Signs for "plus", "minus", and "equals" are "+", "−", "=". × means "times ".

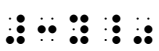


A punctuation indicator is not needed for the opening quotation marks because they are each preceded by a space and so will not be misread as numerals.

b. If the first punctuation mark is a comma, a hyphen, or a short dash, a punctuation indicator is needed before the second punctuation mark provided that a punctuation indicator would be required if the first mark were removed and the space which it occupies was not present.

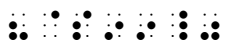
⋙ 3y," 

because without the comma a punctuation indicator is required:

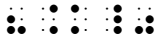


⋙ "$99—" 

because without the dash a punctuation indicator is required:

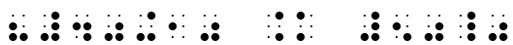


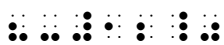
2.5.2 **A Comparison Sign in Quotes.** Note that, although a space is usually left between a comparison sign and an expression which precedes or follows it, a space is not left between a comparison sign and a punctuation mark which applies to it.

⋙ "=" 

Observe how this applies to the equals sign in Example 2-8.

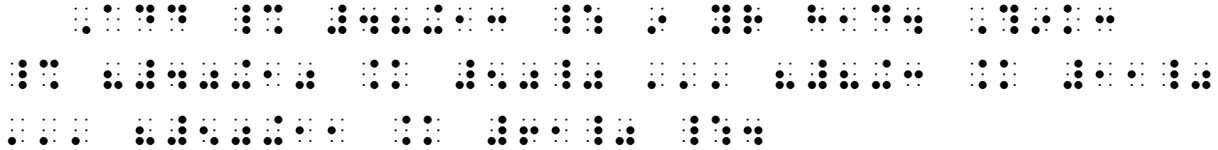
2.5.3 **A Number in Quotes.** A numeric indicator is required when a number or a negative number immediately follows an opening quotation mark.

⋙ "40 + 10 = 50" 

⋙ "−12" 

Example 2-9

Add 48 + 13 in your head. Think: "40 + 10 = 50" ... "8 + 3 = 11" ... "50 + 11 = 61".



Even though this ellipsis is not mathematical (it indicates pausing while thinking), the ellipsis of the Nemeth Code is used because it is inside the Nemeth switches. The final period applies to the entire sentence. It is placed after the Nemeth Code terminator.

2.5.4 **Digital Clock Time.** Digital clock time is transcribed in UEB unless the time is involved in computation or is part of a number line, in which case Nemeth symbols are used. A punctuation indicator precedes the colon to prevent misreading the colon as the number 3. A numeric indicator is then required to set the reading mode back to "numeric."

⫸ 3:30

UEB: ⠼⠉⠒⠼⠉⠚

Nemeth: ⠸⠩ ⠼⠒⠸⠒⠼⠒⠴ ⠸⠱

Recall from Lesson 1 that the numeric indicator is not restated when a hyphen connects Nemeth numerals.

⫸ 7:45-8:20

UEB: ⠼⠛⠒⠼⠙⠑⠤⠼⠓⠒⠼⠃⠚

Nemeth: ⠸⠩ ⠼⠶⠸⠒⠼⠲⠢⠤⠦⠸⠒⠼⠆⠴ ⠸⠱

Example 2-10

Last night, Jayquan arrived at 7:45 and left at 8:20. Use the shortcut method to figure out how many minutes he stayed. 7:45-8:20 = 15+20 = 35. Jayquan stayed for 35 minutes.

1 ⠀⠀⠠⠇⠁⠌ ⠝⠊⠣⠞⠂ ⠠⠚⠁⠽⠟⠥⠁⠝ ⠜⠗⠊⠧⠫ ⠁⠞ ⠼⠛⠒⠼⠙⠑ ⠯
2 ⠇⠑⠋⠞ ⠁⠞ ⠼⠓⠒⠼⠃⠚⠲ ⠠⠥⠎⠑ ⠮ ⠩⠕⠗⠞⠉⠥⠞ ⠍⠑⠹⠕⠙ ⠞⠕
3 ⠋⠊⠛⠥⠗⠑ ⠳ ⠓⠪ ⠸⠍ ⠍⠔⠥⠞⠑⠎ ⠓⠑ ⠌⠁⠽⠫⠲
4 ⠸⠩ ⠼⠶⠸⠒⠼⠲⠢⠤⠦⠸⠒⠼⠆⠴ ⠨⠅ ⠼⠂⠢⠬⠆⠴ ⠨⠅ ⠼⠒⠢ ⠸⠱⠲
5 ⠠⠚⠁⠽⠟⠥⠁⠝ ⠌⠁⠽⠫ ⠿ ⠼⠉⠑ ⠍⠔⠥⠞⠑⠎⠲

It is not necessary for the digital time to be transcribed in the same code within the same word problem. UEB is used in the narrative (lines 1 and 2) and Nemeth is used in the computation (line 4).

2.6 Punctuation with Omission Signs

When a sign of omission represents omitted mathematical content the appropriate Nemeth symbol is transcribed. A Nemeth omission symbol is punctuated mathematically. Related punctuation is unspaced from the omission symbol.

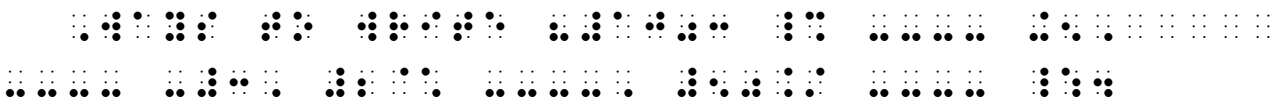
⫸ 2 × ..., ⠼⠆ ⠈⠡ ⠄⠄⠄⠠

⫸ 2 × ___. ⠼⠆ ⠈⠡ ⠤⠤⠤⠤⠸⠲

Take another look at this example from Lesson 1. Notice the use of the mathematical comma with the long dash.

Example 2-11

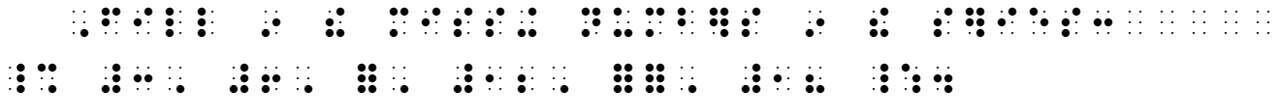
Ways to write "10": ___ + 5, ___ − 3, 2 × ___, 50 ÷ ___.



Reminder: A space is inserted between a long dash and an operation symbol. Note that, on line 2, the omission symbol (long dash) is placed on the same line as the rest of its math expression even though there is room for the long dash on the first line.

Example 2-12

Fill in the missing numbers in the series: 3, 6, ?, 12, ??, 18.



Switch Decision: These question marks represent omissions and so the Nemeth general omission symbol is required. (Revisit Section 1.11 in Lesson 1.) In order to avoid excessive code switching, the entire series is transcribed in Nemeth even though the numerals themselves could be transcribed in either code. Reminders: The general omission symbol is spaced according to rules of the item it represents (in this case, a numeral). The same number of omission symbols shown in print is used in braille.

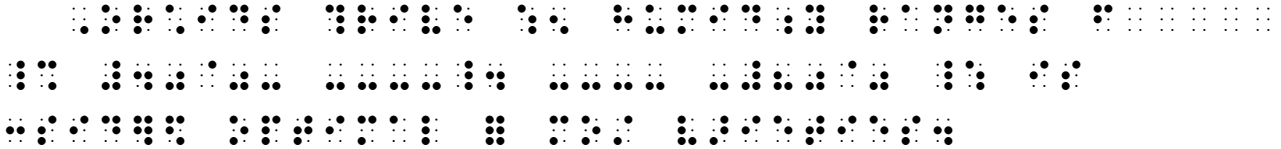
2.6.1 **Spacing Exception—The Hyphen.** Although no space is left between an ellipsis and a related punctuation mark or between a long dash and a related punctuation mark, if the punctuation mark is a hyphen then a space is required.

⋙ 40% - __

⋙ ... -9.3

Example 2-13

Orchids thrive when humidity ranges from 40% - __. __ -80% is considered optimal for most varieties.



A space is inserted between each hyphen and long dash.

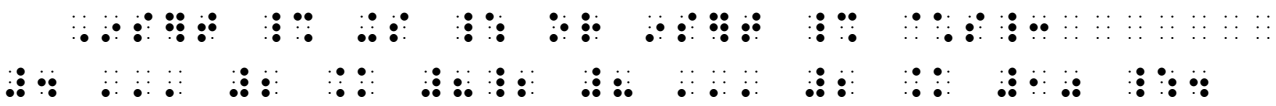
2.7 Punctuation and Spacing of Plural or Possessive Endings

When "s" or apostrophe-s is attached to a mathematical item, it becomes part of that expression. This means that the "s" is punctuated mathematically.

⋙ ×s:

Example 2-14

Insert +s or insert ×s: $4 \ldots 2 = 8;\ 8 \ldots 2 = 10.$



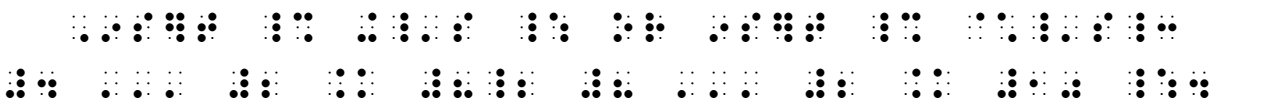
Reminder: A mathematical expression must not be divided between braille lines if it will fit on one line within current margins. The expression "4 ... 2 = 8" must not be divided and so it begins on line 2.

A punctuation indicator is required before the apostrophe in a possessive ending "apostrophe-s". Even so, a punctuation indicator is still required before a punctuation mark that immediately follows the "s". Compare this sample to the previous one.

⋙ ×'s:

Example 2-15

Insert +'s or insert ×'s: $4 \ldots\ 2 = 8;\ 8 \ldots 2 = 10.$



A punctuation indicator is needed both before the apostrophe <u>and</u> before the colon in ×'s:.

The ending is unspaced from the symbol even if the symbol normally requires a space.

⋙ =s

⋙ ='s

Instructions: Here is a list of isolated mathematical items and punctuation marks. Transcribe an opening Nemeth Code indicator in cell 1. Start the list on the next line. Begin each line in cell 1, with any runovers in cell 3. Remain in Nemeth throughout the practice, including the clock time. Place the Nemeth Code terminator on the same line as the last item in the list.

PRACTICE 2B

+, − ; ×, ÷ .

+'s, −'s, ×'s, ÷'s; =s, >s, <s.

" :: "

5.1, 6.22, 7.333; $8.44, $9.55; $10.66.

10:45-11:25

−16 > −___ ; 16 < ___ .

$1,400 < £ ___?

5'3'' ..., 6'1''—6'2'' ..., 7'0''.

"8 · 3 = 3 · 8"

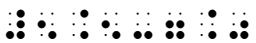
2.8 Summary of the Use and Nonuse of the Punctuation Indicator

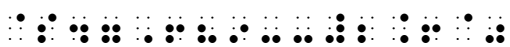
2.8.1 **Situations That Do Not Require a Punctuation Indicator.** A punctuation indicator is not required before any of the following punctuation marks. In these isolated samples, assume that the technical material continues after what is shown.

a. The mathematical comma never requires a punctuation indicator.

⋙ 5.0,

b. A punctuation indicator is not used before a hyphen or a dash.

⋙ 5.5-7.0 

⋙ $47,689—2.6% 

c. A punctuation indicator is not needed if the first character following a space is a punctuation mark or if the punctuation mark begins on a new line.

⋙ "+", "−" 

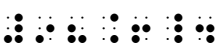
d. In a sequence of punctuation marks following a mathematical expression, the punctuation indicator precedes only the first punctuation mark.

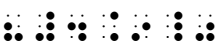
⋙ "=". 

e. In the next lesson, another situation where the punctuation indicator is not required will be presented: after a word or abbreviation.

2.8.2 **Situations That Require a Punctuation Indicator.** A punctuation indicator is required after any symbol of the type listed below when Nemeth has not been terminated and the mark of punctuation is not a comma, hyphen, or dash. In the following isolated samples, assume that the technical material continues after the final punctuation mark.

a. After a numeric symbol.

⋙ 98.6. 

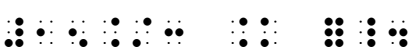
⋙ "4.9" 

b. After a long dash or after an ellipsis.

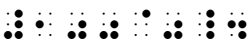
⋙ 24 = 6 + __. 

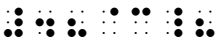
⋙ 1, 3.1413, … ; 

c. After a general omission symbol.

⋙ 15 ÷ 3 = ?. 

d. After any of the miscellaneous symbols presented so far.

⋙ 100%. 

⋙ 48¢? 

e. After a comma, hyphen, or short dash, provided that if these were removed and the space which they occupy were not present, one of the conditions a-e, above, would apply.

⋙ 3y," 

⋙ "$99—" 

Other situations where the punctuation indicator is required will be presented later in this course. See also, Section 2.12.1 in this lesson.

INTRODUCTION TO SIGNS OF GROUPING

2.9 Definition

In mathematical context, symbols such as parentheses, braces, and brackets are not considered to be punctuation; they are classified as signs of grouping. Here are some grouping signs commonly encountered in technical material.

⠐⠣	Left Parenthesis	(
⠐⠜	Right Parenthesis	)
⠸⠣	Left Curly Brace	{
⠸⠜	Right Curly Brace	}
⠨⠣	Left Square Bracket	[
⠨⠜	Right Square Bracket	]
⠸⠈⠣	Left Angle Bracket	⟨
⠸⠈⠜	Right Angle Bracket	⟩
⠳	Vertical Bar	|
⠳⠳	Double Vertical Bar	‖

More signs of grouping will be presented in Lesson 7.

2.10 Signs of Grouping with Numerals

a. The numeric indicator is not used before a numeral that immediately follows a grouping symbol.

⠠⠠⠠ (3)(5) ⠐⠣⠼⠉⠐⠜⠐⠣⠼⠑⠐⠜

Example 2-16

"Three times five" can be written this way: (3)(5).

⠠⠠⠠⠐⠣⠼⠉⠐⠜⠐⠣⠼⠑⠐⠜ ⠠⠠⠠⠐⠣⠼⠉⠐⠜⠐⠣⠼⠑⠐⠜

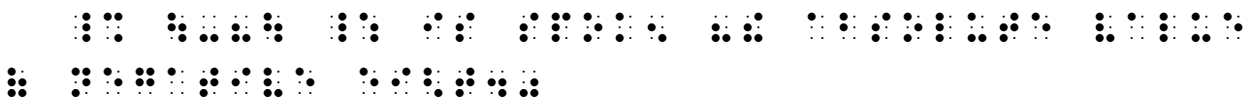
These parentheses function as mathematical symbols representing multiplication, therefore a switch to Nemeth is required.

b. The numeric indicator is not used after a minus sign that immediately follows a grouping symbol.

⠠⠠⠠ |−8| ⠳⠤⠼⠓⠳

Example 2-17

|−8| is spoken "the absolute value of negative eight."



The numeral −8 *is preceded by a grouping symbol; no numeric indicator is needed.*

2.10.1 **Identifiers.** Nemeth parentheses are used for the parentheses associated with an identifier that is transcribed inside the code switches.

⋙ (1) 

Lacking a left grouping sign, the numeric indicator is required when the numeral is preceded by a space or begins a braille line.

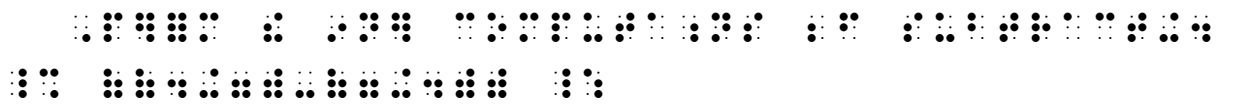
⋙ 1) 

2.11 Nested Grouping Symbols

When two or more grouping signs follow one another the outer set may be printed using a taller size in order to visually distinguish the nested groupings. The braille transcription does not differentiate between the sizes—regular grouping symbols are transcribed.

Example 2-18

Perform the inner computations before subtracting. $\big((4+7)-(7+4)\big)$

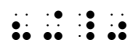


In print, the first and last parentheses are taller than the others.

Code-Switching Considerations

2.12 Enclosed Technical Material

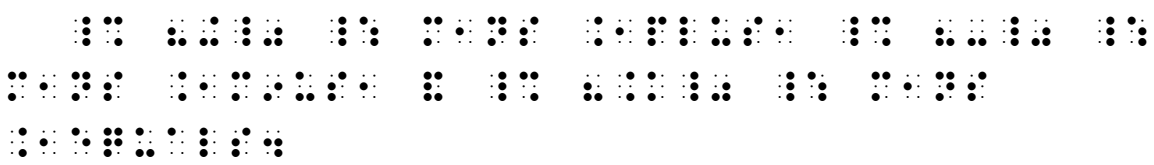
When parentheses, brackets, braces, or quotation marks enclose a Nemeth symbol or expression, the paired punctuation is transcribed inside the code switches.

⋙ "+" 

⋙ $(2+2=4)$ 

Example 2-19

"+" means *plus*, "−" means *minus*, and "=" means *equals*.



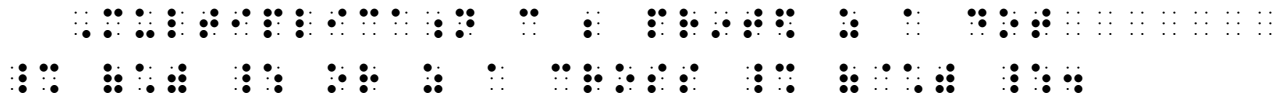
A punctuation indicator must be inserted before each closing quotation mark.

a. Recall that many UEB punctuation symbols can be used inside of the code switches (a period, a semicolon, a colon, to name a few). UEB parentheses, brackets, and braces do not fall into this category. Inside the switches, Nemeth grouping symbols are transcribed even when the sign has no mathematical meaning.

⋙ (×) 

Example 2-20

Multiplication can be printed as a dot (·) or as a cross (×).



Nemeth parentheses are used inside the switches even when they do not function as mathematical symbols.

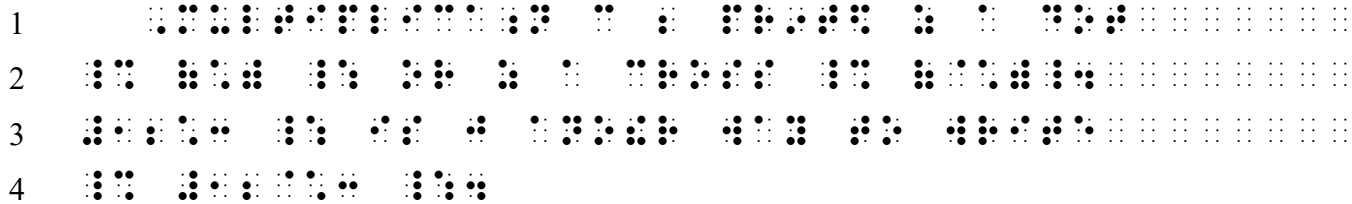
2.12.1 **Punctuation Following a Sign of Grouping.** Nemeth grouping symbols are punctuated mathematically. A mathematical comma (dot 6) is used; a punctuation indicator is required before other punctuation marks except the hyphen and the dash.

⋙ (×), 

⋙ (×). 

Example 2-21

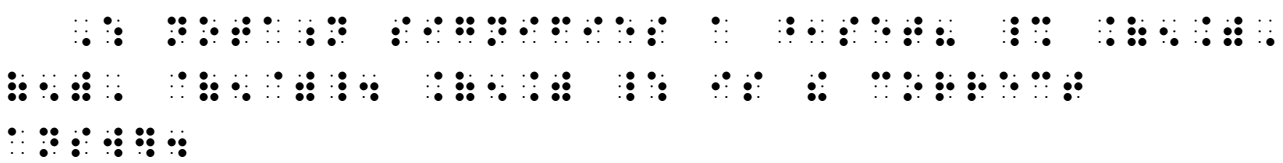
Multiplication can be printed as a dot (·) or as a cross (×). $12 \cdot 3$ is just another way to write 12×3.



Line 2: A punctuation indicator must be inserted before the first period because Nemeth is not terminated between the first and second sentence.

Example 2-22

Which notation signifies a **set**? {5}, (5), [5]. {5} is the correct answer.



The mathematical comma (dot 6) is used following the first two grouping symbols. A punctuation indicator must be inserted before the first period because Nemeth is not terminated between the first and second sentence.

2.13 Paired Parentheses and Brackets

Paired grouping symbols must be transcribed in the same code. When parentheses or brackets are functioning as punctuation enclosing Nemeth material the Nemeth symbols are used. However, when paired parentheses or brackets enclose a phrase which begins or ends in UEB the punctuation is transcribed in UEB in order to match. Look carefully at the placement of code switch indicators in Examples 2-23 and 2-24.

Example 2-23

($1.01 is the correct answer.)

To transcribe both opening and closing parentheses in UEB, the opening Nemeth Code indicator is placed just inside the opening UEB parenthesis.

Example 2-24

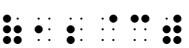
[The answer is 99¢]

To transcribe both opening and closing brackets in UEB, the Nemeth Code terminator is placed just inside the closing UEB square bracket.

Spacing with Signs of Grouping

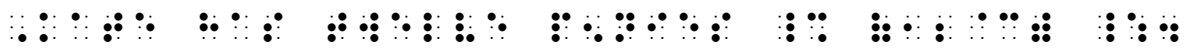
2.14 Spacing Inside of the Grouping Signs

Unless other rules apply, no space is left between an opening or a closing sign of grouping and the material which it contains.

- ⋙ [−4] 
- ⋙ (12¢) 

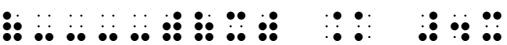
Example 2-25

Kate has twelve pennies (12¢).



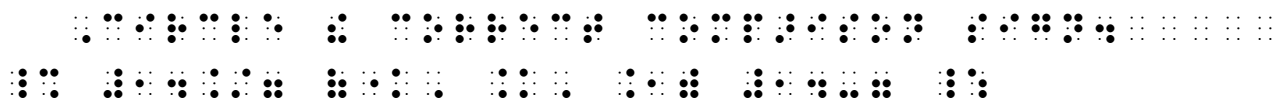
Recall that a numeric indicator is not needed when a number is preceded by a grouping symbol.

This spacing rule also applies to a symbol which usually requires spacing—no space is left between a dash, an ellipsis, a sign of comparison, or any other symbol and its grouping sign.

- ⋙ (__)(x) = 4x 
- ⋙ || … ||
- ⋙ (<, =, >)

Example 2-26

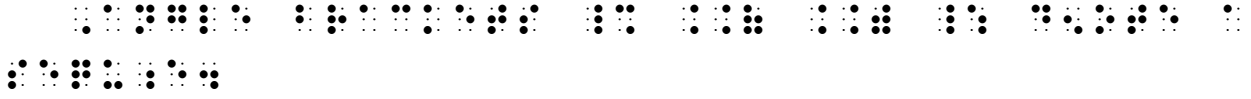
Circle the correct comparison sign. 14 ÷ 7 (<, =, >) 14 − 7



2.14.1 **Special Case.** When a space is printed between an opening and a closing sign of grouping and that blank space does not represent an omission, the space between the grouping signs is included in the braille transcription.

Example 2-27

Angle brackets ⟨ ⟩ denote a sequence.



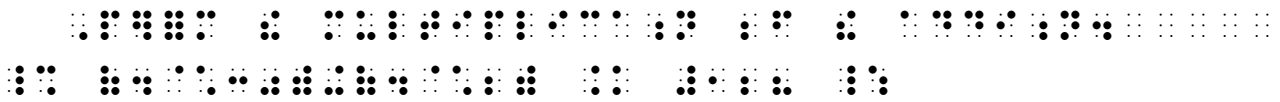
Context will help you determine whether the print sign is an angle bracket or a "less than" or a "greater than" symbol.

2.15 Spacing Outside of the Grouping Signs

The spacing before and after a grouped expression is subject to the spacing rules for the signs which precede or follow the grouping.

Example 2-28

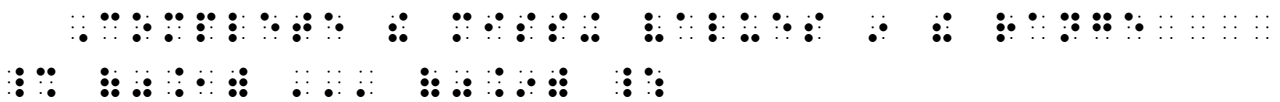
Perform the multiplication before the addition. $(4 \times 30) + (4 \times 2) = 128$



Operation signs are unspaced; comparison signs are spaced.

Example 2-29

Complete the missing values in the range (0.1) ... (0.9)



The ellipsis is spaced.

a. No space is left between a grouped expression and a numeral when these items are part of the same expression unless other spacing rules apply. These items often appear to be spaced in print.

Example 2-30

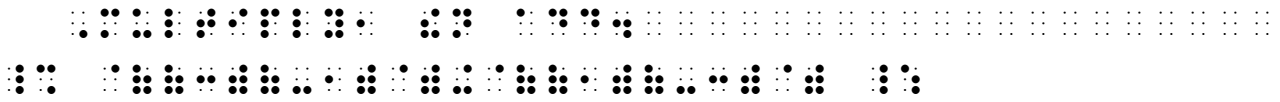
Does $5\,(9 + 7) = (5 \cdot 9) + 7$?

In print, the first 5 is spaced away from the following left parenthesis. There is no space in braille.

b. No space is left between a grouped expression and another sign of grouping when these items are part of the same expression unless other spacing rules apply. These items often appear to be spaced in print.

Example 2-31

Multiply, then add. $[\,(3)\,(-1)\,] + [\,(1)\,(-3)\,]$



Instructions: Format each line or sentence in print as a 3-1 paragraph in braille.

PRACTICE 2C

Is $3(-2.5) + (-4)$ the same as $3\big(-2.5 + (-4)\big)$?

Use a number line to illustrate this addition problem: $[-4 - (-1)] + [-1 - (-3)]$.

$7 + (-3) + (-4) = ?$

$8 + |(-2) + (-3)| = ?$

$|2(-7.5)| + 3.2(2) = ?$

The **multiplicative identify** [*sic*] property is illustrated: $(83)(1) = 83$.

A **unit set** is a set containing only one element. For example, {9} is a unit set containing the element "9".

What is the meaning of the symbol "||" in "The answer is ‖3.1‖"?

A finite decimal (such as 0.152) is one that stops, whereas an infinite decimal (such as 0.9999…) repeats indefinitely.

2.16 Code Switching with Itemized Material

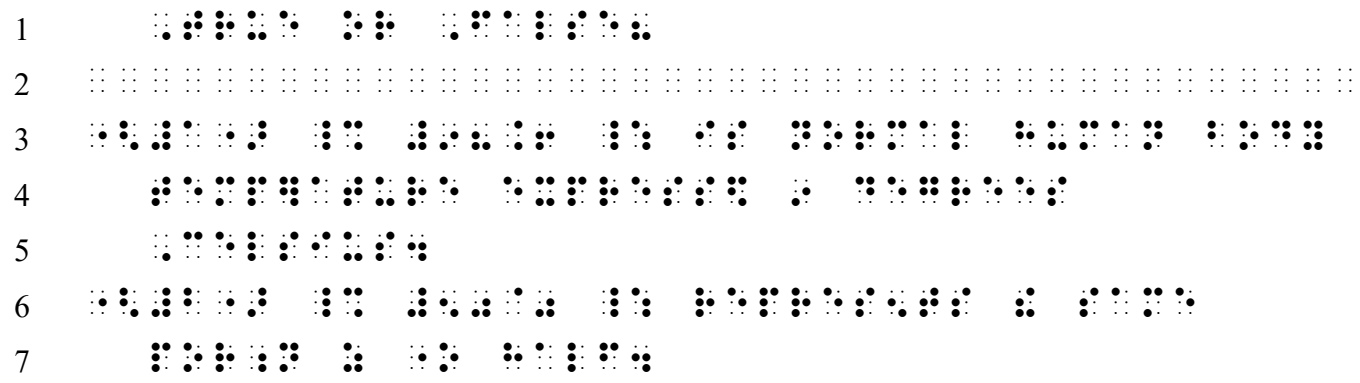
Identifiers may be transcribed in either code. All identifiers need not be transcribed in the same code. Regarding placement of the code switches in itemized formats, the following suggestions are flexible guidelines and may vary according to circumstances, at the transcriber's discretion.

2.16.1 Placement of the Opening Nemeth Code Indicator

a. *Isolated Nemeth.* When an itemized math item needs both an opening and closing code switch indicator, place the opening indicator after the identifier.

Example 2-32

True or False?
(1) 98.6 is normal human body temperature expressed in degrees Celsius.
(2) 50% represents the same portion as one half.

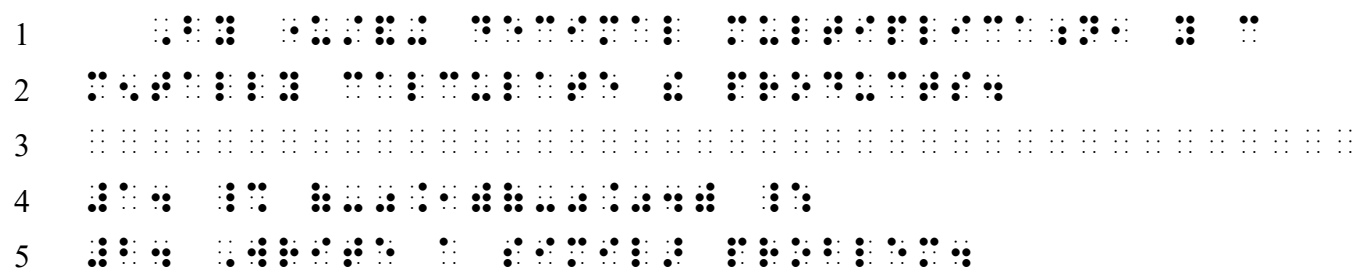


Line 1: The paragraph ends in UEB.
Line 2: A blank line precedes the itemized format.
Line 3: The identifier is in UEB. The switches are placed before and after the decimal numeral.
Line 6: The identifier is in UEB. The switches are placed before and after the percentage.

Example 2-33

By understanding decimal multiplication, you can mentally calculate the products.

1. $(-0.1)\,(-0.04)$
2. Write a similar problem.



Line 2: The paragraph ends in UEB.
Line 3: A blank line precedes the itemized format.
Line 4: The identifier is in UEB. The switches are placed before and after the math portion.
Line 5: UEB resumes.

b. *Nemeth Continues.* When Nemeth does not terminate at the end of an itemized math expression, place the opening switch with the preceding UEB material. If it does not fit on that line, it is placed in the runover cell.

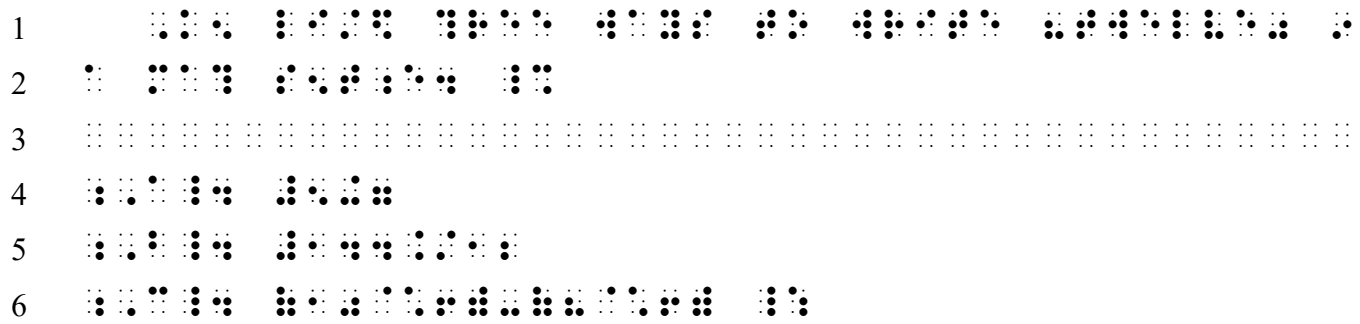
Example 2-34

Ken listed three ways to write "twelve" in a math sentence.

A. 5+7

B. $144 \div 12$

C. $(10 \times 6) - (8 \times 6)$



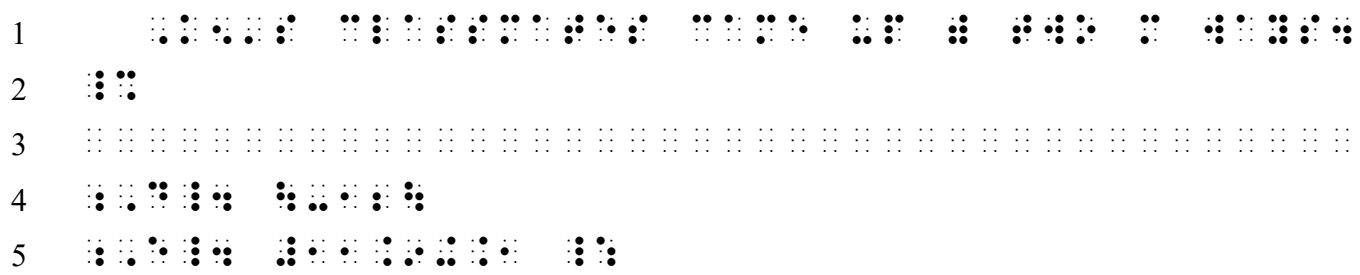
Line 2: The opening Nemeth Code indicator is placed at the end of the line of text.
Line 3: A blank line precedes the itemized format.
Line 4: The identifier is in Nemeth.
Line 5: Nemeth continues.
Line 6: Nemeth continues, and is terminated at the end of the line.

Example 2-35

Ken's classmates came up with two more ways.

D. $|-12|$

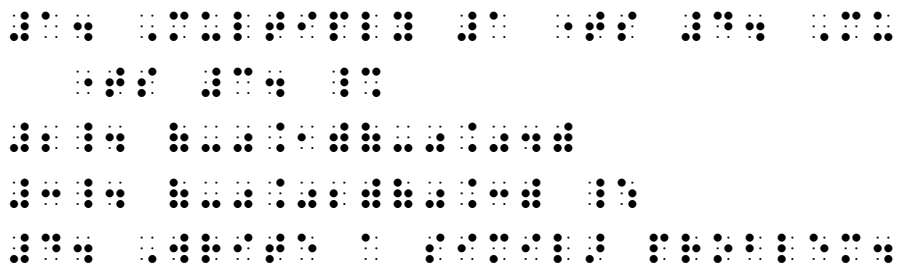
E. $11.9 + .1$



Line 1: The text ends in cell 40.
Line 2: The opening Nemeth Code indicator is placed in the runover cell of the paragraph (cell 1).
Line 3: A blank line precedes the itemized format.
Line 4: The identifier is in Nemeth.
Line 5: Nemeth continues, and is terminated at the end of the line.

Example 2-36

1. Multiply 1 times 4. Multiply 2 times 3.
2. $(-0.1)\ (-0.04)$
3. $(-0.02)\ (0.3)$
4. Write a similar problem.

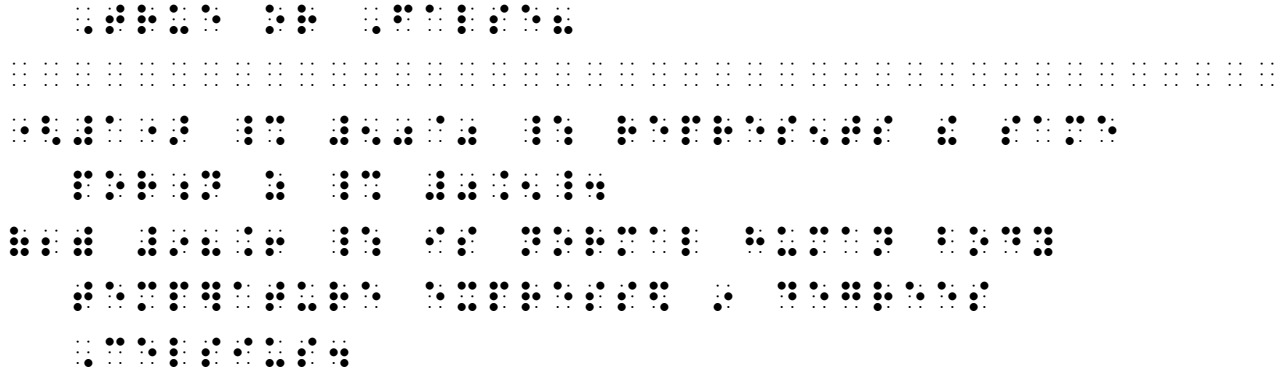


Line 1: The sentence is entirely in UEB.
Line 2: The opening Nemeth Code switch indicator is placed at the end of the sentence because more than one Nemeth item follows.
Line 3: The identifier is in Nemeth.
Line 4: Nemeth continues and is then terminated before proceeding to the next item, which is in UEB.

c. *Nemeth Continues.* When only an identifier comes between two Nemeth items, avoid excessive code switching by transcribing the identifier in Nemeth.

Example 2-37

True or False?
(1) 50% represents the same portion as 0.5.
(2) 98.6 is normal human body temperature expressed in degrees Celsius.



Line 4: An opening switch precedes the decimal number at the end of item (1). Because Nemeth continues at the beginning of the next item, Nemeth is not terminated. (Note the use of the punctuation indicator before the period.)
Line 5: The identifier is transcribed in Nemeth, using Nemeth grouping symbols and a lower-cell numeral. Nemeth is terminated after the decimal numeral.

d. *Top of Page.* Coming from UEB text, when itemized material begins at the top of a braille page and the first two items are transcribed in Nemeth, place the opening switch in cell 1 on the line before the first item. If a blank line is required, it is on the line before the opening switch.

Example 2-38

1. $(-0.1)\ (-0.04)$
2. $(-0.02)\ (0.3)$
3. ...

Transcription 2-38(a) assumes that there is no text on lines 24 and 25 of the preceding page.

```
1  ⠸⠩
2  ⠼⠂⠸⠲ ⠷⠤⠴⠨⠂⠾⠷⠤⠴⠨⠴⠲⠾
3  ⠼⠆⠸⠲ ⠷⠤⠴⠨⠴⠆⠾⠷⠴⠨⠒⠾
4  ⠼⠒⠸⠲ ⠄⠄⠄ ⠸⠱
```

Line 1: When more than one Nemeth item begins at the top of a braille page, the opening Nemeth Code indicator is placed in cell 1, alone on the line.
Line 2: The identifier is in Nemeth.
Lines 3-4: Nemeth continues and is terminated after the last math item.

Transcription 2-38(b) assumes that there is text on line 24 and/or line 25 of the preceding page.

```
1  
2  ⠸⠩
3  ⠼⠂⠸⠲ ⠷⠤⠴⠨⠂⠾⠷⠤⠴⠨⠴⠲⠾
4  ⠼⠆⠸⠲ ⠷⠤⠴⠨⠴⠆⠾⠷⠴⠨⠒⠾
5  ⠼⠒⠸⠲ ⠄⠄⠄ ⠸⠱
```

Line 1: A blank line is required before the change in format.
Line 2: When more than one Nemeth item begins at the top of a braille page, the opening Nemeth Code indicator is placed in cell 1, alone on the line.
Line 3: The identifier is in Nemeth.
Lines 4-5: Nemeth continues and is terminated after the last math item.

2.16.2 **Placement of the Nemeth Code Terminator.** The Nemeth Code terminator is placed after the last math item. If it does not fit on that line, it is placed in the runover cell of the current layout.

Example 2-39

1. $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 = ?$

2. $1 + 2 + 3 + 4 + 5 + \cdots + 95 + 96 + 97 + 98 + 99 = ?$

```
1  ⠸⠩
2  ⠼⠂⠸⠲ ⠼⠂⠬⠆⠬⠒⠬⠲⠬⠢⠬⠖⠬⠶⠬⠦⠬⠔ ⠨⠅ ⠿
3  ⠼⠆⠸⠲
4    ⠼⠂⠬⠆⠬⠒⠬⠲⠬⠢⠬ ⠄⠄⠄ ⠬⠔⠢⠬⠔⠖⠬⠔⠶⠬⠔⠦⠬⠔⠔ ⠨⠅ ⠿⠀⠀
5    ⠸⠱
```

This transcription assumes that there is no text on lines 24 and 25 of the preceding page.
Line 1: When more than one Nemeth item begins at the top of a braille page, the opening Nemeth Code indicator is placed in cell 1, alone on the line.
Line 2: The identifier is in Nemeth.
Line 3: Nemeth continues. The math will not fit on this line.
Line 4: The math begins in the runover cell (cell 3). There is not room for the Nemeth Code terminator.
Line 5: The Nemeth Code terminator is in the runover cell (cell 3).

2.16.3 **Midline Horizontal Ellipsis**. Notice the ellipsis in the previous example. It is printed at the midline rather than at the baseline. The midline horizontal ellipsis represents the continuation of a pattern. It is transcribed the same as the baseline ellipsis previously encountered in the lessons.

⫸ $1 + 2 + 3 + \cdots + 97 + 98 + 99$

⠼⠂⠬⠆⠬⠒⠬ ⠄⠄⠄ ⠬⠔⠶⠬⠔⠦⠬⠔⠔

PRACTICE 2D

1) $7 \times 28 = (7)(28)$

2) The box is 2'4'' in height.

3) 5' is the same as 60''

4) $12' + 15'' = 13'3''$

2.17 Code Switching with Unitemized Listed Nemeth Items

This topic is not addressed in the Nemeth Code. In the lesson exercises, please follow these guidelines when switching codes before or after a list of unitemized Nemeth items.

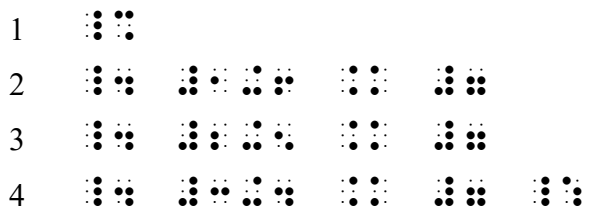
2.17.1 **A List of Nemeth Items in One Column.** Place the opening Nemeth Code indicator in cell 1 on a line by itself. Begin the list on the next line. Place the Nemeth Code terminator following the last Nemeth item, at the end of that line if room allows. If there is not room on the line, place the closing switch in the runover position. This layout was demonstrated in Practice 2B.

2.17.2 **A Multi-Column List of Nemeth Items.** Place the opening Nemeth Code indicator in cell 1 on a line by itself. Begin the list on the next line. Place the Nemeth Code terminator on the line following the multi-column list, in cell 1. This layout was demonstrated in Exercise 1.

2.17.3 **A Bulleted List.** The bullet symbols can be transcribed in either code. There is no need to switch out of Nemeth in order to transcribe a bullet.

Example 2-40

- $1 + 6 = 7$
- $2 + 5 = 7$
- $3 + 4 = 7$



2.17.4 **A List with a Heading.** Code switching after a heading will be discussed in Lesson 4.

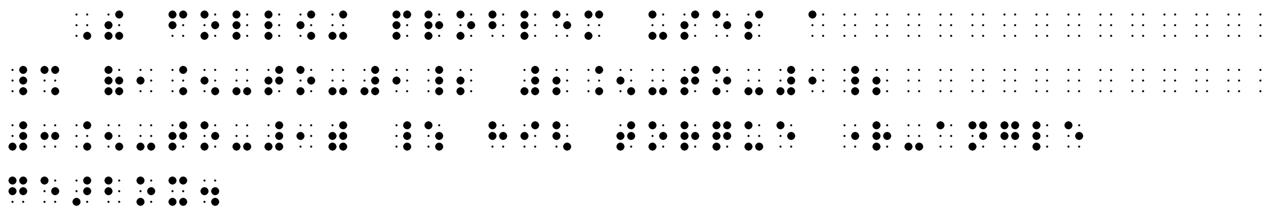
Format

2.18 Keep Together—Hyphenated Expressions

A hyphenated expression containing one or more mathematical components must not be divided between braille lines. Because Nemeth format rules are applied throughout the transcription, this rule also applies in UEB text when a numeral and a word are connected by a hyphen.

Example 2-41

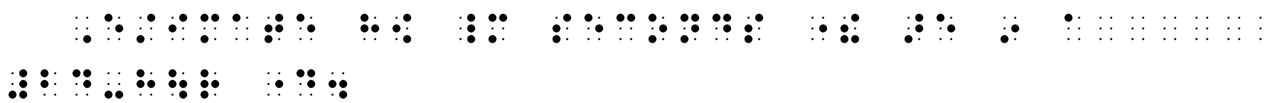
The following problem uses a (1.5-to-1; 2.5-to-1; 3.5-to-1) high torque right-angle gearbox.



Lines 1 and 2: The hyphenated expressions are not divided.

Example 2-42

Estimate how many seconds there are in a 24-hour day.



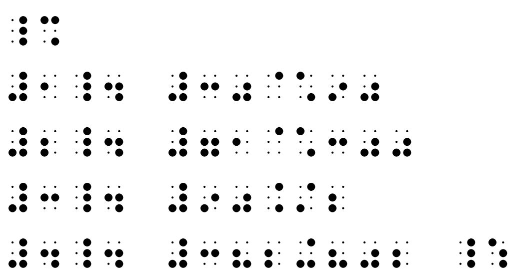
"24-hour" is not divided, even in UEB context.

2.19 Side-by-Side Layout of Itemized Material

When the print copy arranges itemized material side by side across the page, the braille format is changed so that all identifiers start in cell 1.

Example 2-43

1. 30×90 2. 71×300 3. $90 \div 2$ 4. $382 + 802$



Each identifier begins in cell 1 in the braille transcription, even though they are printed side by side.

2.20 Identifiers and Braille Page Turns

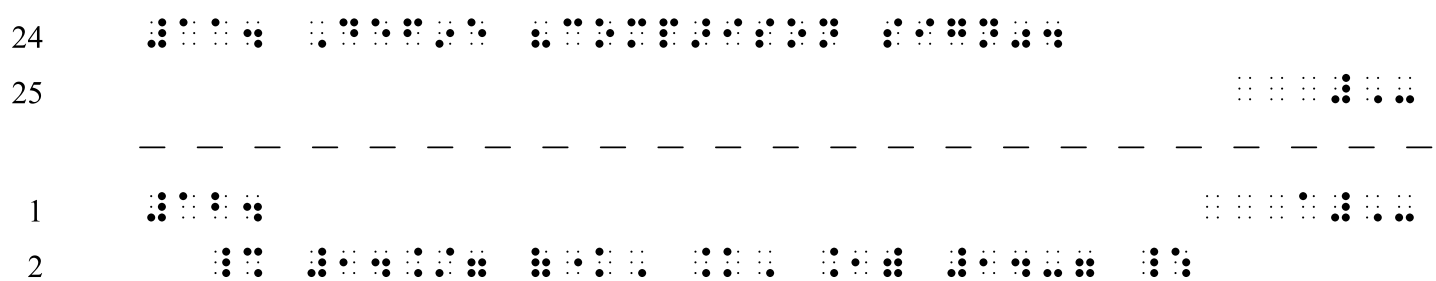
In this course we follow the *Braille Formats* guideline that an itemized problem should not be divided between braille pages. Be careful not to leave an identifier standing alone at the bottom of a braille page.

2.20.1 **Print Page Number Interference.** A math expression may begin in the runover cell of the line following the identifier (line 2) if the space taken up by the print page number on line 1 will not allow it to fit there. Keeping the math expression together on one braille line takes precedence.

Example 2-44

11. Define "comparison sign".

12. $14 \div 7 \ (<,\ =,\ >)\ 14-7$



Line 25: Item 12 and its math expression will not fit on this line because line length is restricted to 34 cells due to the 2-digit braille page number. Although the identifier will fit, it must not stand alone at the bottom of the page.
Line 1: Item 12 and its math expression will not fit on this line because line length is restricted to 33 cells due to the print page number. The identifier is placed on line 1.
Line 2: The math expression and its two code switch indicators will fit on one line and so are placed here, starting in the runover cell (cell 3).

For further practice, see Addendum 1—Reading Practice.

Submit Exercise 2 to your instructor.

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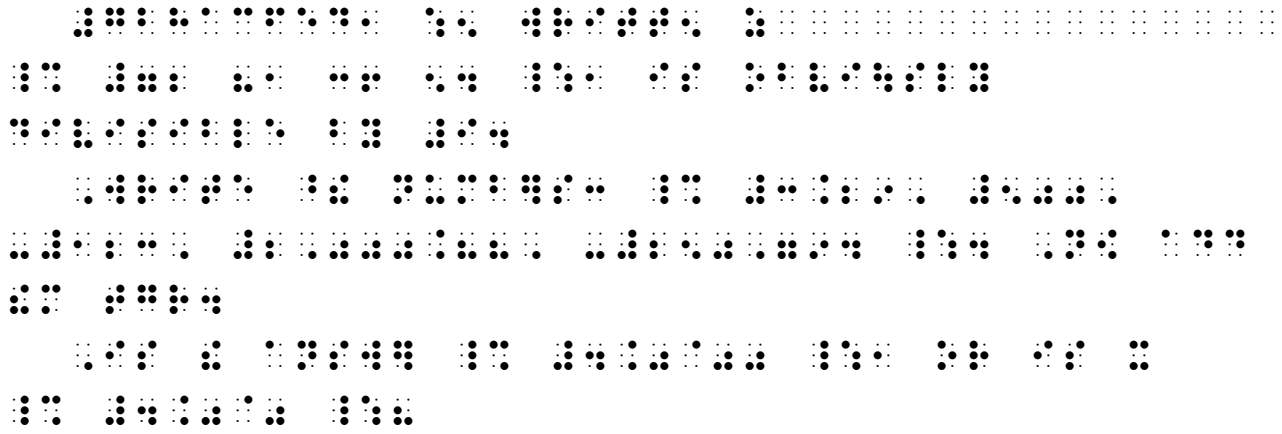
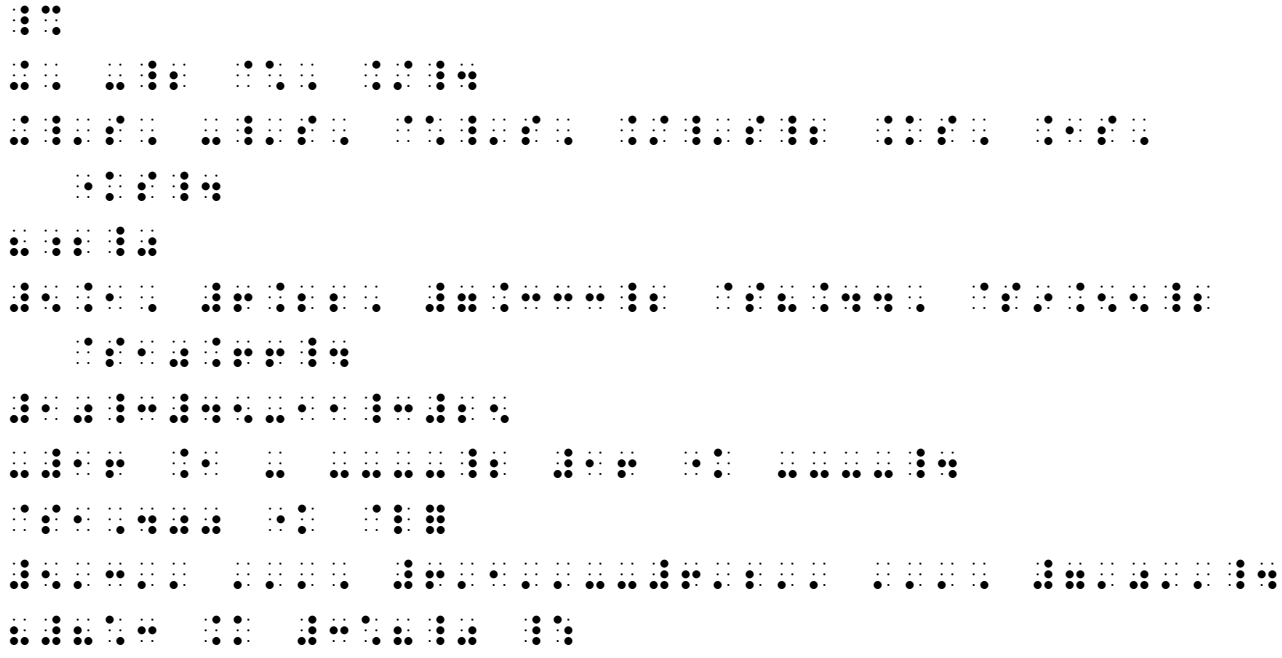
ANSWERS TO PRACTICE MATERIAL

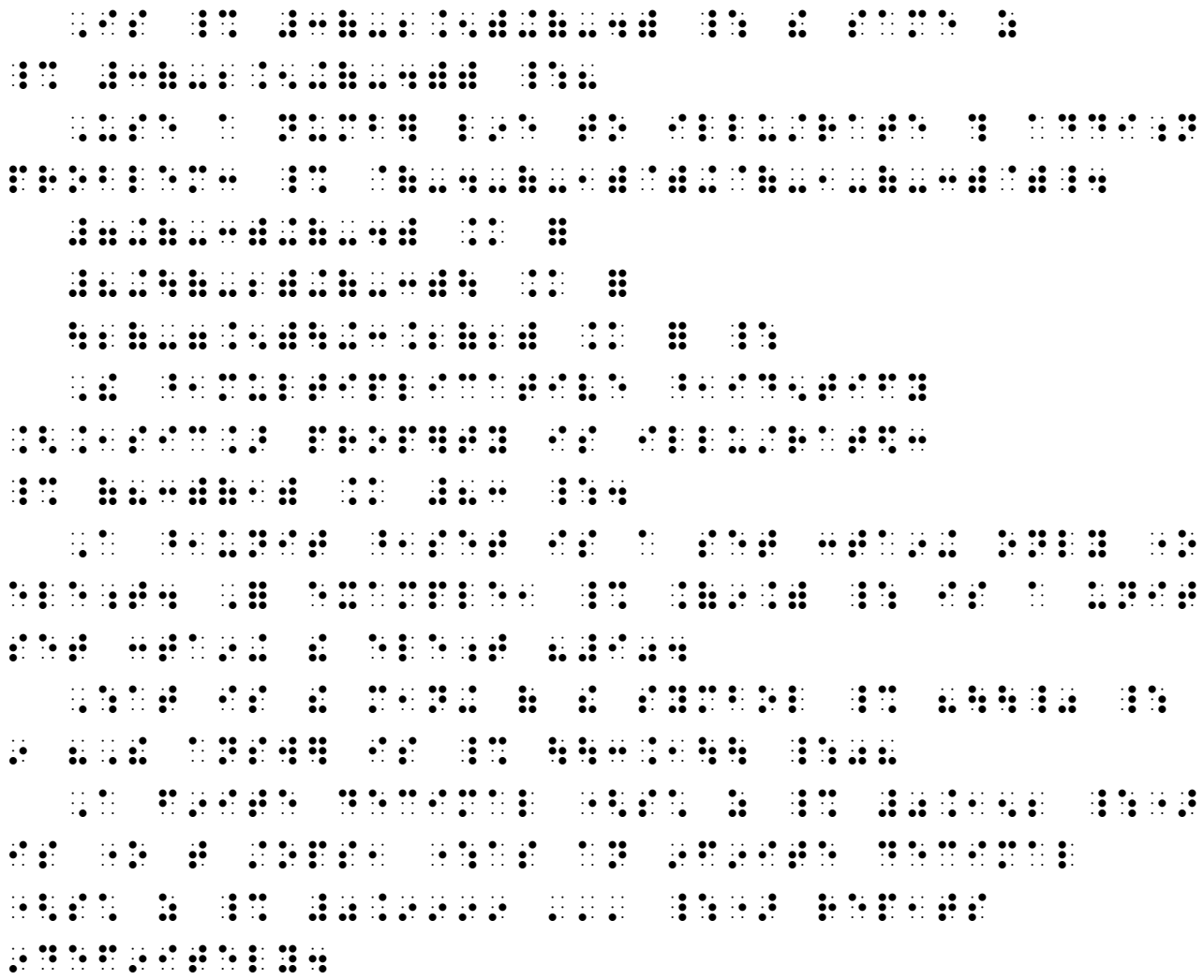
PRACTICE 2A



PRACTICE 2B



PRACTICE 2C



PRACTICE 2D