LESSON 18

LESSON PREVIEW

Code switching in tables is examined, including considerations regarding box lines and transcriber's notes. Some rules about technical diagrams are introduced. The technique of keying long labels and table entries is explored.

TABLES

An introduction to table format was given in Lesson 5. Stem-and-leaf plots were studied in Lesson 16. Further rules which apply to tables are illustrated in this lesson.

18.1 Structure of Tables

Tables consisting entirely of words are transcribed in UEB. When mathematical data occur in the table, code switching decisions depend upon the content of the entire table and the spacing restrictions encountered on the braille page. If you are unfamiliar with table formats, please read the Tables section in *Braille Formats, Principles of Print-to-Braille Transcription*. There you will find details concerning the layout of the columns and rows, how to handle omissions and blanks within the table, and strategies to consider when a table is too wide to fit within the margins of the braille page.

Every table presents a unique challenge. The strategies outlined in this lesson are only a sample of what may be found in your work. Flexibility in the application of table rules will allow you to meet the goal of clarity and readability in your transcription.

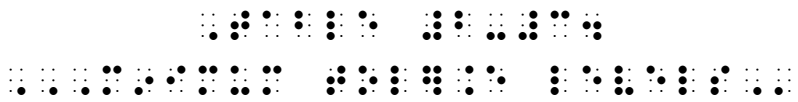
18.2 Table Label and Title

Follow appropriate rules according to the Nemeth code or UEB in table labels and titles, switching to Nemeth when necessary.

Example 18-1

(Table label and title only)

Table 2-3. MINIMUM TOLERANCE LEVELS



The table label and the table title are not mathematical. UEB is used.

Example 18-2

(Table title only)

DIVISION (÷) TABLE

Only the math symbol requires a switch to Nemeth.

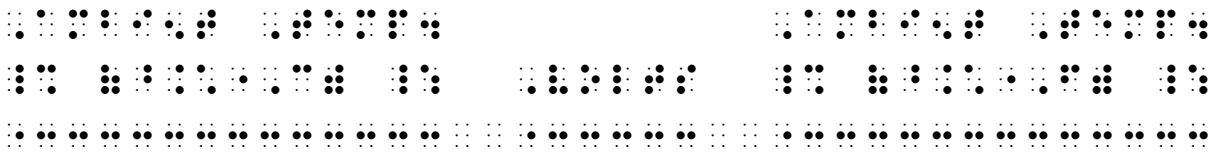
18.3 Column Headings

Follow appropriate rules according to the Nemeth code or UEB for column headings, switching to Nemeth when necessary.

Example 18-3

(Column headings only)

Ambient Temperature (°C)	**Volts**	**Ambient Temperature (°F)**



Only the degree designations are mathematical. (Column headings may be abbreviated in order to fit in the limited space. A transcriber's note is not required when the abbreviation is easily identifiable. See Braille Formats *for further details.)*

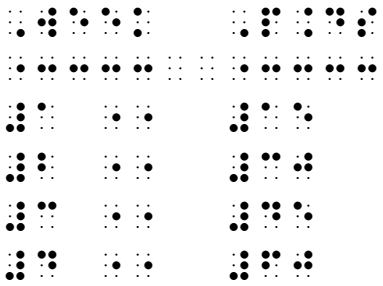
18.4 Table Entries

Table entries may not require a switch to Nemeth, or they may be entirely mathematical, or they may contain a mixture of UEB and Nemeth.

18.4.1 **Tables in UEB.** When entries do not require a switch to Nemeth, the table may be transcribed entirely in UEB.

Example 18-4

Week	**Pounds**
1	15
2	30
3	45
4	60



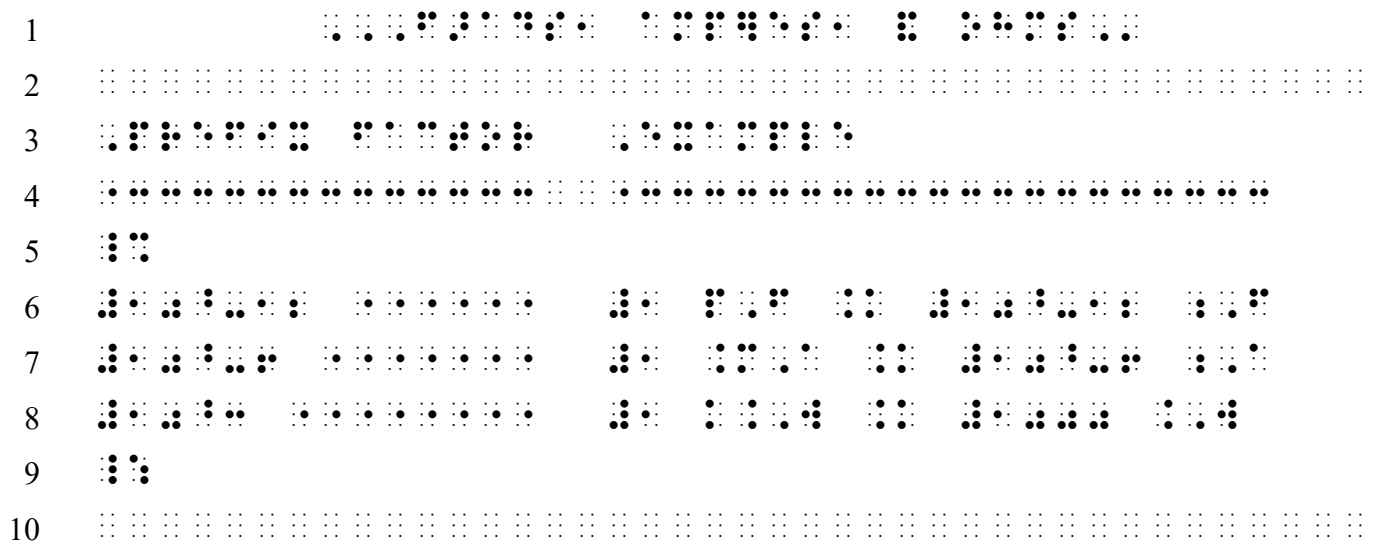
Nothing in this table requires a switch to Nemeth.

18.4.2 **Tables in Nemeth Code.** When entries are entirely mathematical, the opening Nemeth Code indicator is placed at the margin (cell 1) of the line following the column separation line. The entries begin on the next line. The Nemeth Code terminator follows the last line of entries, placed at the margin (cell 1).

Example 18-5

FARADS, AMPERES, AND OHMS

Prefix factor	Example
10^{-12}	$1\ \text{pF} = 10^{-12}\ \text{F}$
10^{-6}	$1\ \mu\text{A} = 10^{-6}\ \text{A}$
10^{3}	$1\ \text{k}\Omega = 1000\ \Omega$

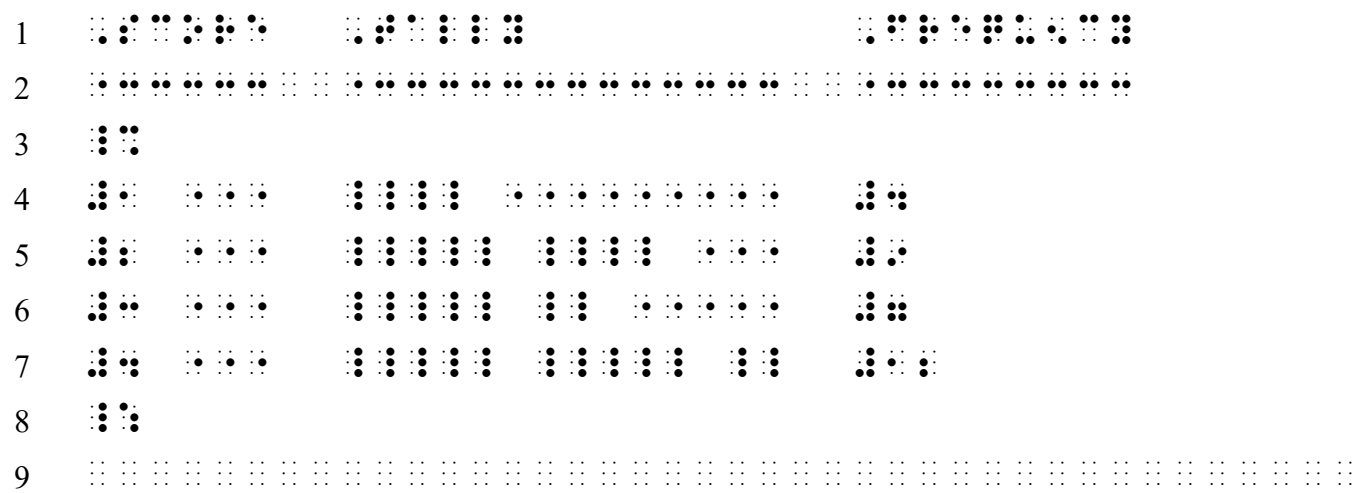


18.4.3 **Code Switching Considerations.** When a mixture of narrative entries and mathematical data occurs in a table, the transcriber may switch to Nemeth only where needed, or the table may be transcribed entirely in Nemeth. Each table must be individually assessed in order to determine the clearest representation in braille. Keeping in mind that a table is read both vertically and horizontally, it is best if a minimum of code switching is encountered within the body of the table. Use common sense, however. For example, if there are very few Nemeth items within a table, switching before and after each item may make more sense than transcribing the entire table in Nemeth. This section examines a few possibilities which you will encounter in your work.

a. **Column Headings in UEB.** When the column headings consist entirely of words, the preferred method is to transcribe them in UEB.

Example 18-6

Score	Tally	Frequency
1	||||	4
2	𝍸 ||||	9
3	𝍸 ||	7
4	𝍸 𝍸 ||	12



Lines 4-7: All of the table entries are transcribed in Nemeth, including the unmodified numbers in columns one and three.

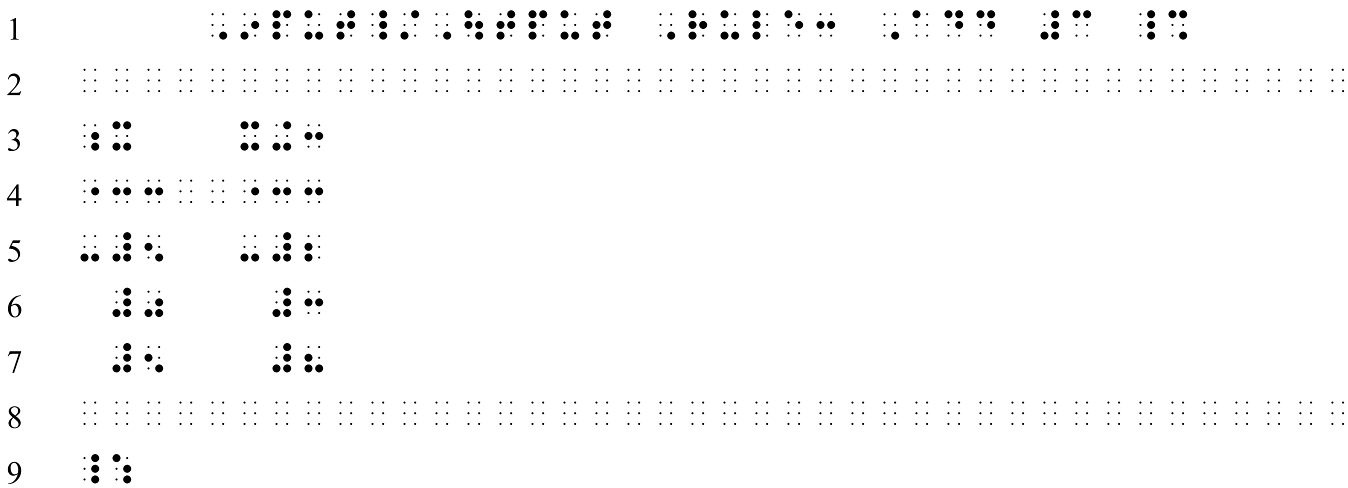
Lines 4-7: Digits in column three are left adjusted in the print table; the same alignment is followed in braille.

b. **Column Headings in Nemeth.** When the column headings consist mostly or entirely of math characters, it may make more sense to use Nemeth entirely. The code switches are placed outside of the required blank lines.

Example 18-7

Input/Output Rule: Add 3

x	$x+3$
-5	-2
0	3
5	8



Line 1: The opening Nemeth Code indicator is placed at the end of the cell-5 heading.
Lines 2 and 8: A blank line precedes and follows the table.
Line 9: The Nemeth Code terminator is placed in cell 1 following the blank line.

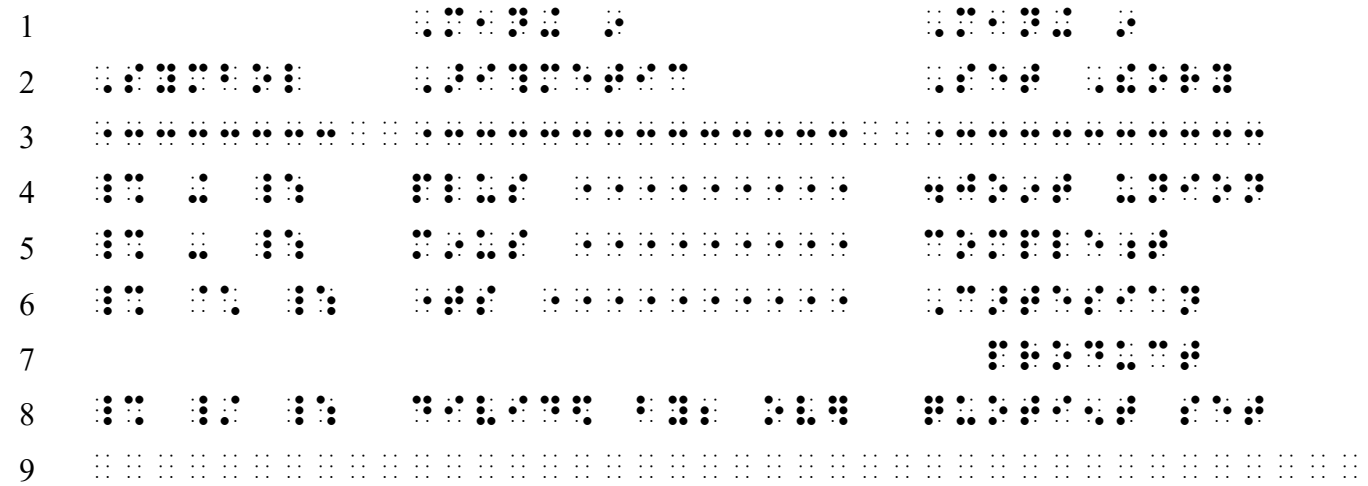
c. **No Column Headings—Only Row Headings.** See Section 18.4.4.

d. **Only One Column of Math Symbols.** Example 18-8 is shown two ways, both legitimate according to the rules. We feel the second transcription is more readable.

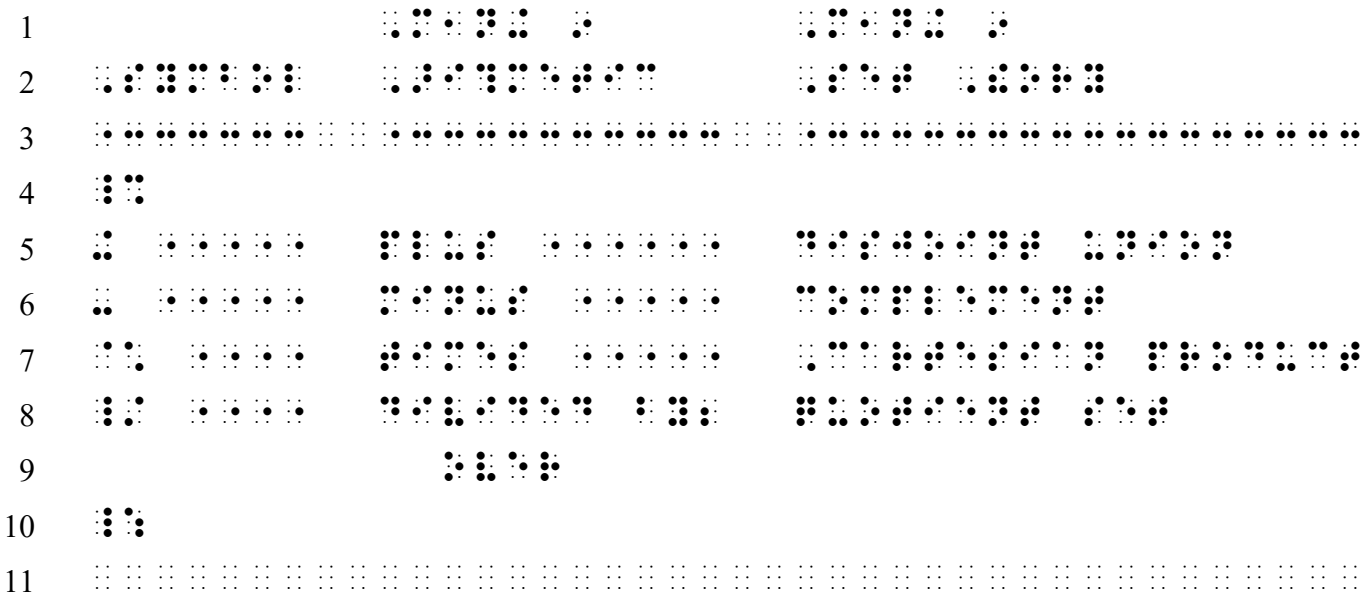
Example 18-8

Symbol	**Meaning in Arithmetic**	**Meaning in Set Theory**
+	plus	disjoint union
–	minus	complement
×	times	Cartesian product
/	divided by; over	quotient set

Transcription a: Switch indicators are required for the math symbols in column 1. The words in columns 2 and 3 are contracted.



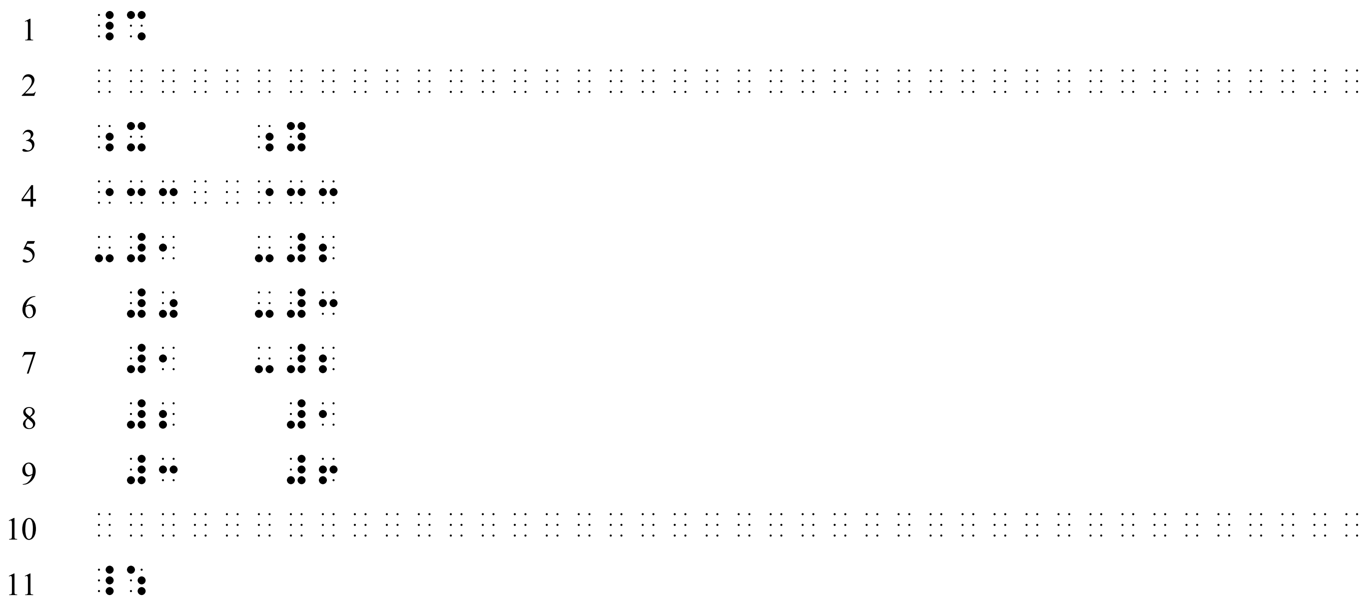
Transcription b (preferred method): The entire body of the table is transcribed in Nemeth. The words are uncontracted.



18.4.4 **A Table of Values.** A table of values showing a set of ordered pairs is best presented entirely in Nemeth, including the column headings. When printed horizontally, a tables of values will not have column headings.

Example 18-9a

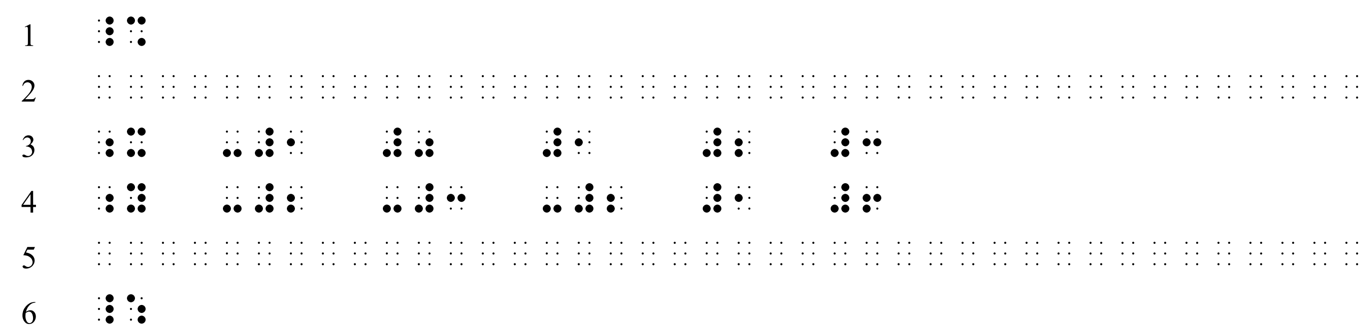
x	y
−1	−2
0	−3
1	−2
2	1
3	6



The code switch indicators are placed outside of the blank lines required before and after the table. The digits in the table entries are aligned as printed.

Example 18-9b

x	−1	0	1	2	3
y	−2	−3	−2	1	6



The code switch indicators are placed outside of the blank lines required before and after the table. The digits in the print table are centered in their columns. In braille, they are left aligned.

PRACTICE 18A

Instructions: If the body of the table can be transcribed entirely in UEB, do so. Center the first table's label on one line and its caption on the next line, disregarding the typeform. Show two ways to transcribe the second table —first, with the column headings in UEB; then, repeat the table heading and transcribe the column headings in Nemeth.

Table 18.1-5 Values and iterations of e.

e	e^2	S
1	1	6
2	4	24
3	9	54
4	16	96

RTD TABLE

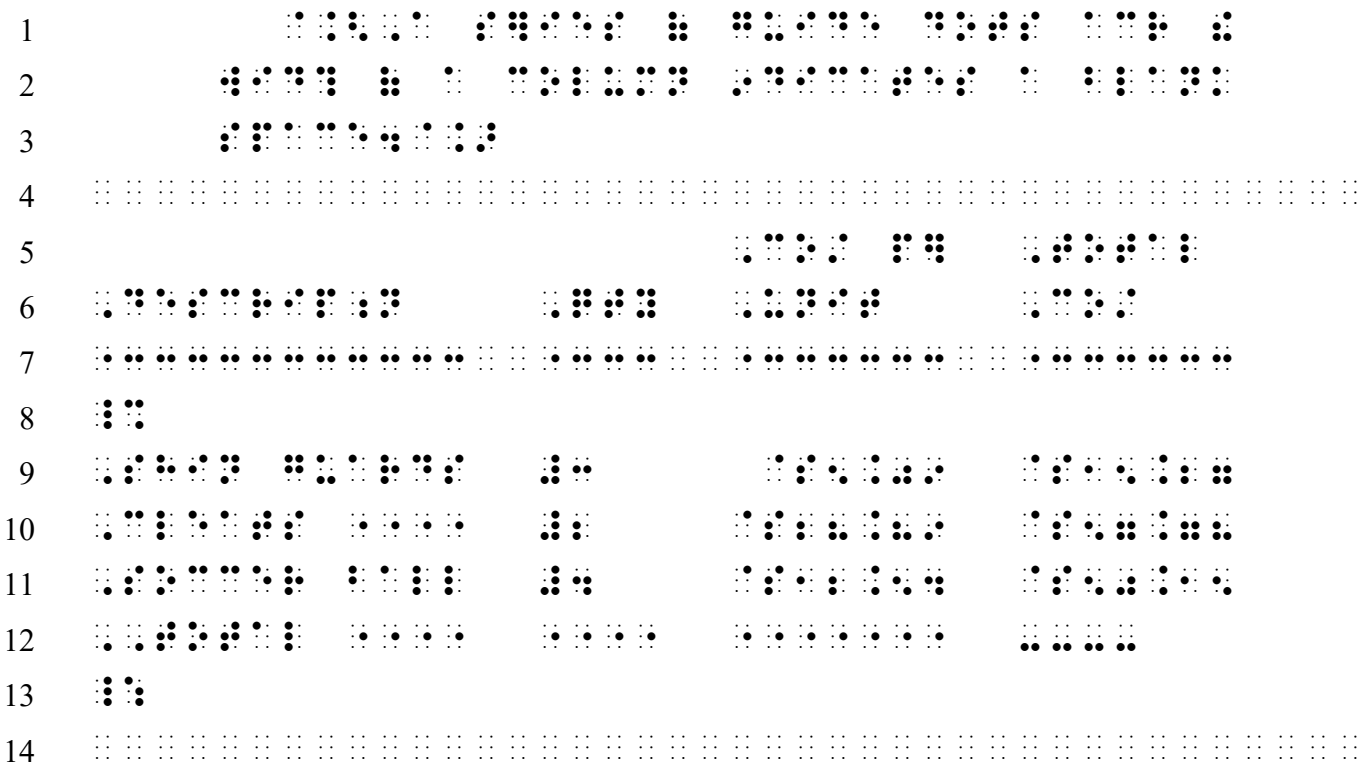
R	T	D
30	$t + 2$	$30(t + 2)$
45	t	$45t$

18.5 When Row Headings are Words

When table entries consist of technical material but the row headings are words, to minimize the use of code switch indicators the entire table (excluding the table title and column headings) is considered to be technical material. Words within the table are transcribed without contractions. The single-word switch indicator is not used.

Example 18-10

Description	**Qty**	**Cost per Unit**	**Total Cost**
Shin guards	3	$5.09	$15.27
Cleats	2	$28.89	$57.78
Soccer ball	4	$12.54	$50.15
TOTAL			_____



Other rules of note in this table: The transcriber's note regarding blank entries is required (see Braille Formats*). The table is preceded and followed by a blank line. Dollar amounts are aligned by place value in print; the same alignment is followed in braille. The Nemeth long dash represents the omission that is printed as a low line.*

PRACTICE 18B

Table A.7

Group	Light	5 days	10 days
Control	12	70.3 ± 2	90 ± 10.5
Test	12	60.4 ± 1.5	78 ± 7.9
Control	16	75.7 ± 8	100 ± 3
Test	16	52.2 ± 2	81 ± 6.7

18.6 Code Switching and Box Lines

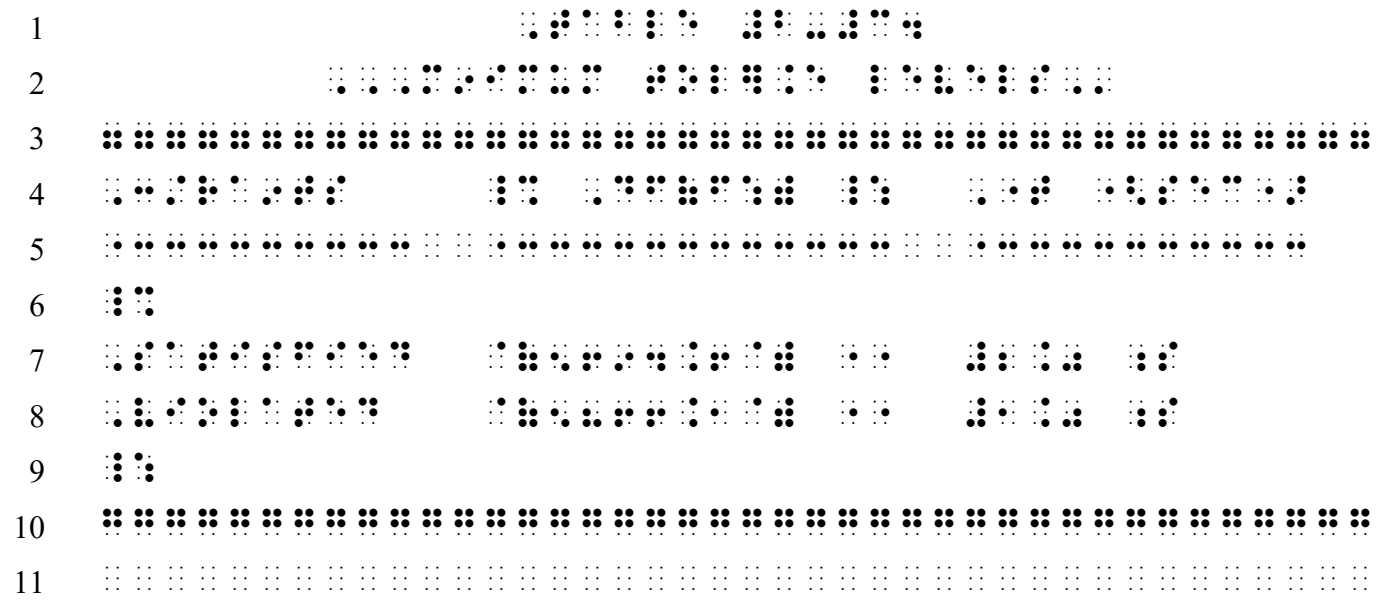
Box lines may be transcribed in either code. Rules regarding box lines are given in *Braille Formats*. Code switching considerations are discussed in this section.

18.6.1 **Switching Within the Table.** When only the body of the table is in Nemeth, the bottom box line is transcribed on the line following the Nemeth Code terminator.

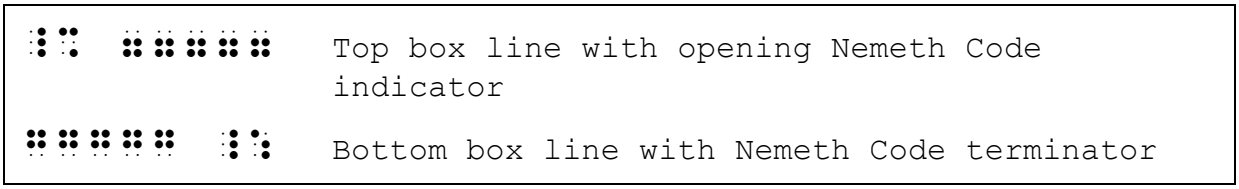
Example 18-11

Table 2-3. MINIMUM TOLERANCE LEVELS

Constraints	$Df(\overline{f})$	Time (sec)
Satisfied	[5694.6]	2.0 s
Violated	[5866.1]	1.0 s

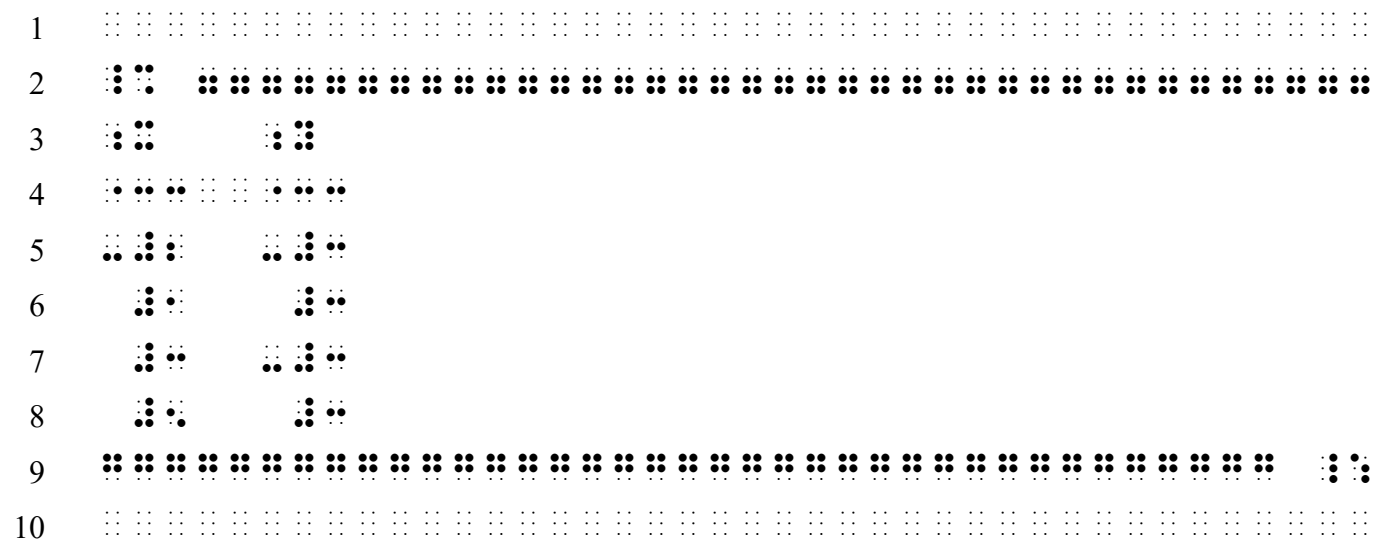


18.6.2 **Switching Within the Box Lines.** For boxed material that is transcribed entirely in Nemeth, the opening Nemeth Code indicator may be included at the beginning of the top box line, followed by a blank space. The Nemeth Code terminator may be included at the end of the bottom box line, preceded by a space.



Example 18-12

x	y
−2	−3
1	3
3	−3
5	3

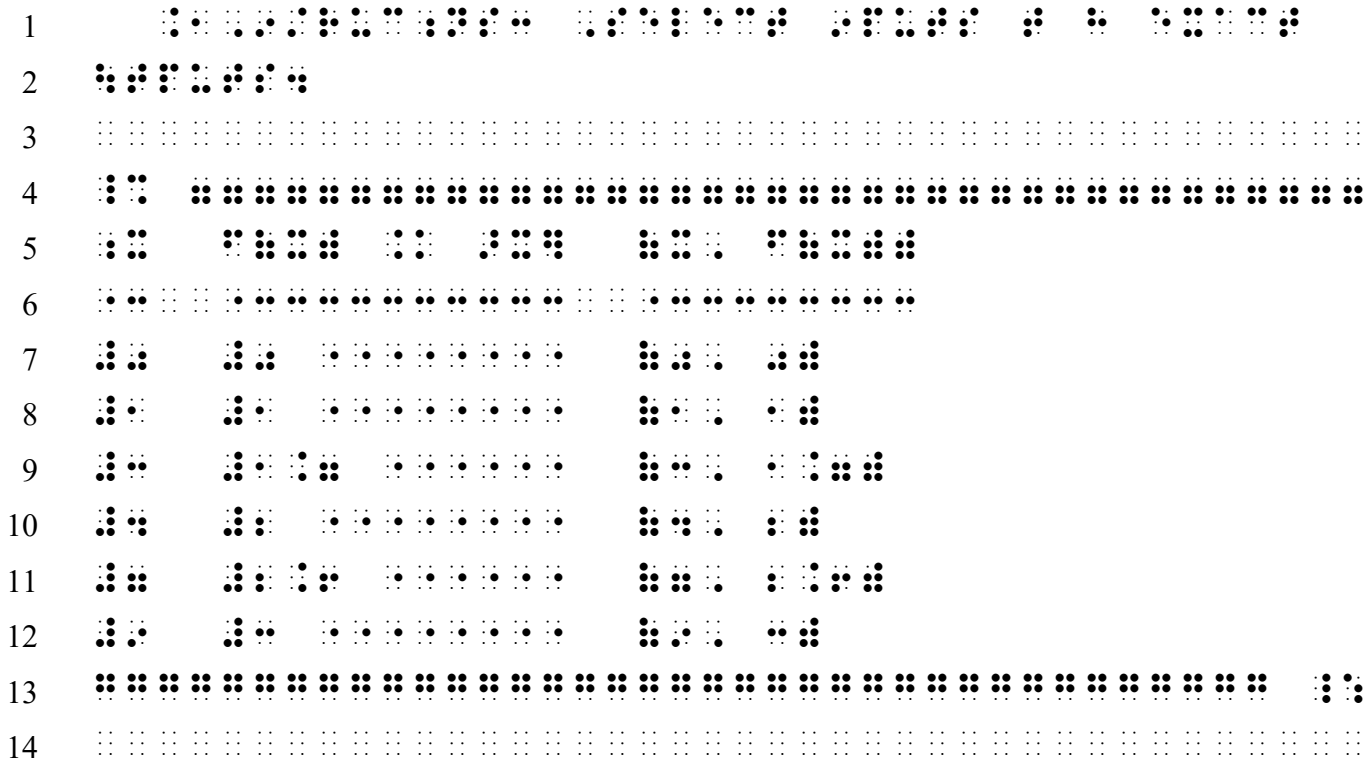


The negative sign dictates use of Nemeth in this table of values. The values are aligned as printed, by digit. The vertical line between columns is not transcribed.

Example 18-13

Instructions: Select inputs that have exact outputs.

x	$f(x) = \sqrt{x}$	$(x, f(x))$
0	0	(0, 0)
1	1	(1, 1)
3	1.7	(3, 1.7)
4	2	(4, 2)
7	2.6	(7, 2.6)
9	3	(9, 3)



Lines 1-2: Nemeth Instructions format (5-3) is applied only when followed by itemized material. These instructions are formatted as a narrative paragraph (3-1).

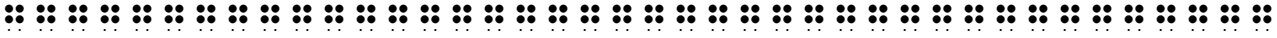
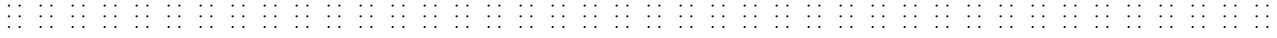
Lines 3 and 14: A blank line is required before the top box line as well as after the bottom box line unless it sits on line 25 of the braille page.

18.6.3 **Technical Material Before or After a Box.** If technical material immediately precedes or follows the box, the code currently in use continues through the box line.

Example 18-14

The table below shows values for the line $y = 2x - 3$.

IN (x)	-3	-2	-1	0	1	2
OUT (y)	-9	-7	-5	-3	-1	1

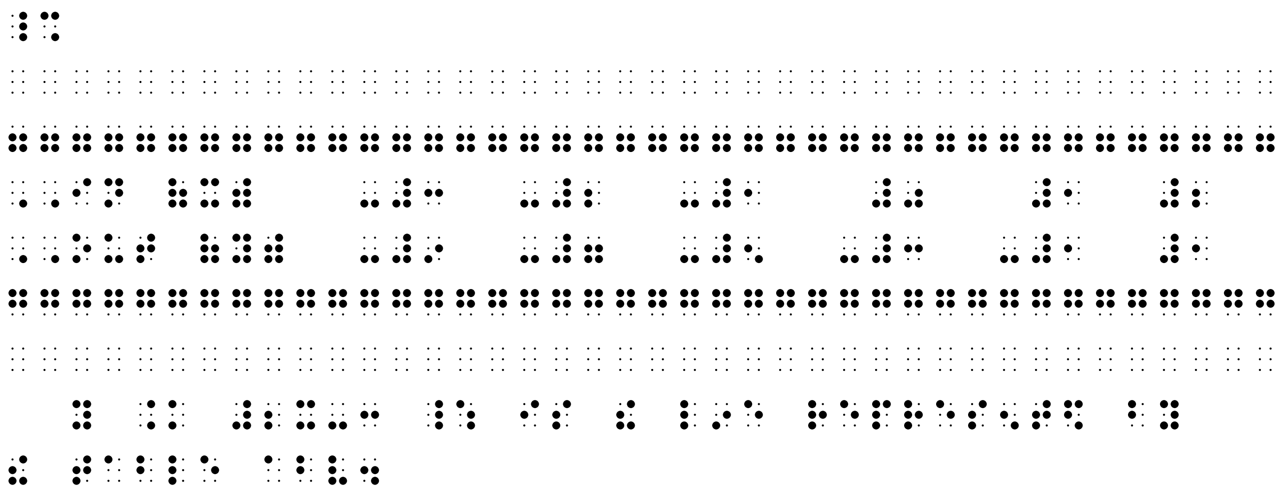
1 
2 
3 
4 
5 
6 
7 
8 
9

Line 2: Nemeth begins here and is not terminated at the end of the sentence.
Line 3: A blank line precedes the top box line.
Lines 5-6: The entire table is in Nemeth, including the row headings, which are uncontracted. The numerals are right adjusted in their columns, as printed. Internal table lines are disregarded.
Line 7: The box lines must match; the Nemeth Code terminator is not included in the bottom box line.
Line 8: A blank line follows the bottom box line.
Line 9: Nemeth is terminated after the completion of the table.

Example 18-15

IN (x)	-3	-2	-1	0	1	2
OUT (y)	-9	-7	-5	-3	-1	1

$y = 2x - 3$ is the line represented by the table above.



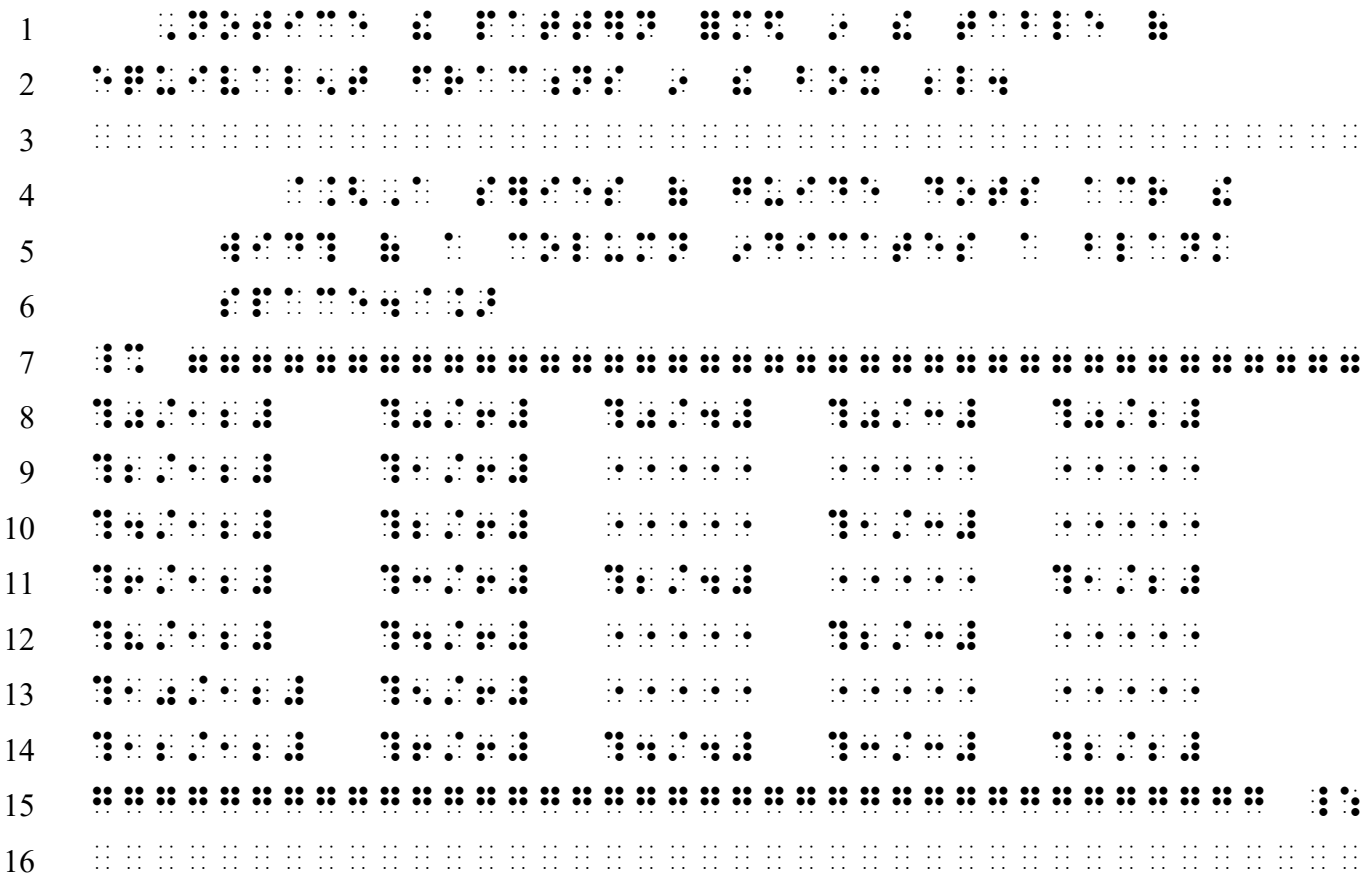
Line 1: Because Nemeth continues after the boxed table, the opening Nemeth Code indicator is placed before the box. This ensures that the box lines will match.
Line 2: A blank line precedes the top box line.
Line 4: The numerals are right adjusted in their columns, as printed. Internal table lines are disregarded
Line 7: A blank line follows the bottom box line.
Line 8: Nemeth continues at the beginning of the paragraph. UEB resumes after the equation.

18.6.4 **Placement of Transcriber's Note.** A transcriber's note that refers to boxed material is usually placed inside the box. However, since the transcriber's note indicators are a UEB symbol, an exception is allowed for boxed material that is entirely in Nemeth. The note may be transcribed above the top box line in order to allow the insertion of switch indicators in the box lines themselves. Two versions of Example 18-16 illustrate these options.

Example 18-16

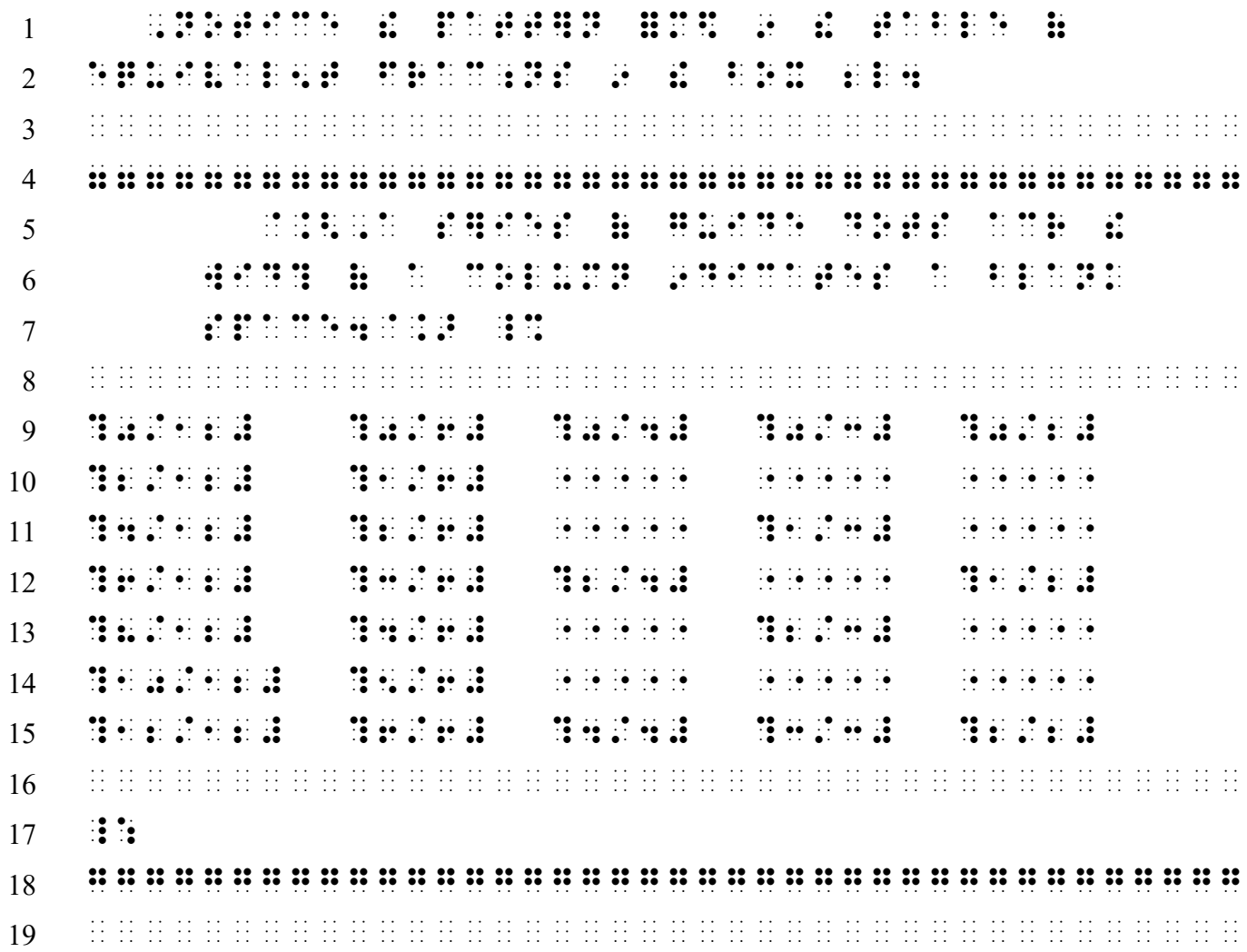
Notice the pattern formed in the table of equivalent fractions in the box below.

$\frac{0}{12}$	$\frac{0}{6}$	$\frac{0}{4}$	$\frac{0}{3}$	$\frac{0}{2}$
$\frac{2}{12}$	$\frac{1}{6}$			
$\frac{4}{12}$	$\frac{2}{6}$		$\frac{1}{3}$	
$\frac{6}{12}$	$\frac{3}{6}$	$\frac{2}{4}$		$\frac{1}{2}$
$\frac{8}{12}$	$\frac{4}{6}$		$\frac{2}{3}$	
$\frac{10}{12}$	$\frac{5}{6}$			
$\frac{12}{12}$	$\frac{6}{6}$	$\frac{4}{4}$	$\frac{3}{3}$	$\frac{2}{2}$



Because the note refers to the information in the box, the blank line required before the top box line precedes the transcriber's note.

Example 18-16, alternate transcription



Placing the transcriber's note inside the box adds three more lines to the transcription.

PRACTICE 18C

Format Instructions: A table must begin in cell 1, even when following an identifier. Use top and bottom box lines, and column separation lines. Disregard typeform in the column headings.

1) Given exponent x, compute the value of y by completing each table.

a)

$\boldsymbol{x}$	$\boldsymbol{2^x = y}$	$\boldsymbol{y}$
-1	$2^{-1} = y$	?
2	$2^2 = y$	?

b)

$\boldsymbol{x}$	$\boldsymbol{2^{x+1} = y}$	$\boldsymbol{y}$
3	$2^4 = y$	?
5	$2^6 = y$	?

More Table Rules Specific to the Nemeth Code

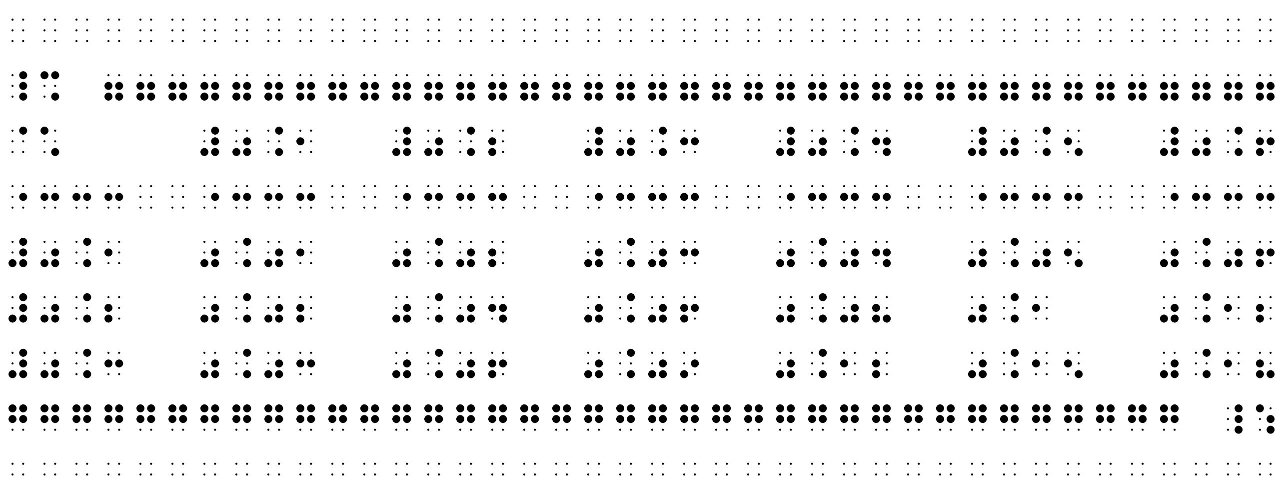
18.7 A Table of Numbers

18.7.1 **Numeric Indicator May Be Omitted.** When row headings and entries in a table consist entirely of numerals, the numeric indicator may be omitted from the entries. The numerals can contain commas or decimal points but may not contain any other symbol. This rule applies only to the table data, not to the headings.

This technique is used only as a space saving option. The table must be transcribed in Nemeth when the numeric indicator is omitted. (The UEB numeric passage indicator is not used in a Nemeth transcription.) A transcriber's note is not required to explain the omitted numeric indicator.

Example 18-17

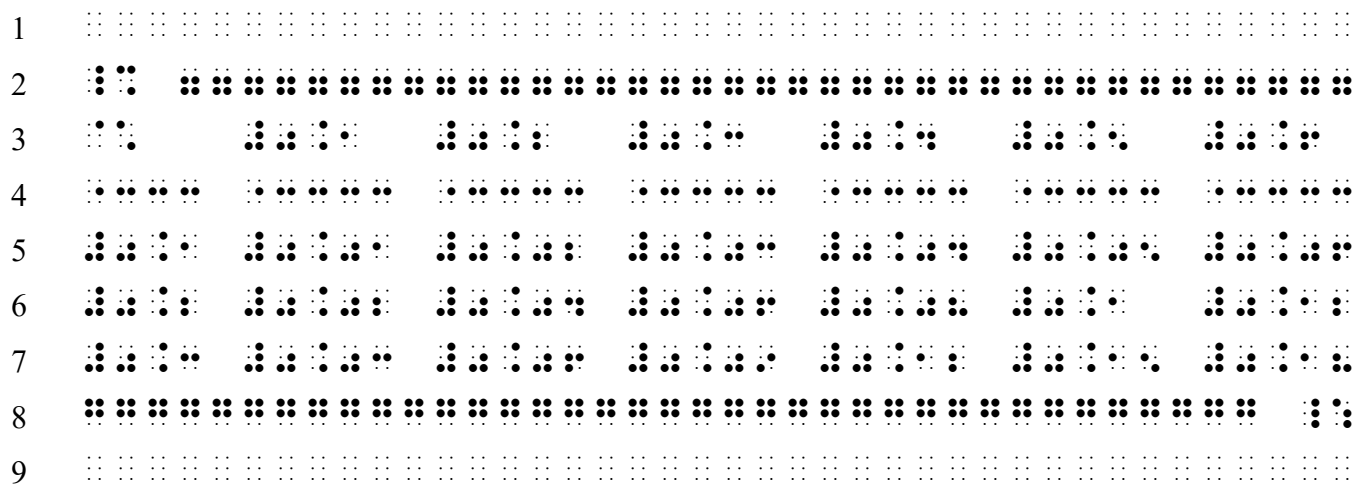
×	**0.1**	**0.2**	**0.3**	**0.4**	**0.5**	**0.6**
0.1	0.01	0.02	0.03	0.04	0.05	0.06
0.2	0.02	0.04	0.06	0.08	0.1	0.12
0.3	0.03	0.06	0.09	0.12	0.15	0.18



In order to retain print layout, the numeric indicator is omitted in the body of the table. The column headings and the row headings use a numeric indicator.

Note: *Braille Formats* guidelines allow for one blank column of cells between columns when the table consists entirely of numbers, as long as the column headings are no wider than the longest entry in the column. This alternate option is shown on the next page.

Example 18-17, alternate option

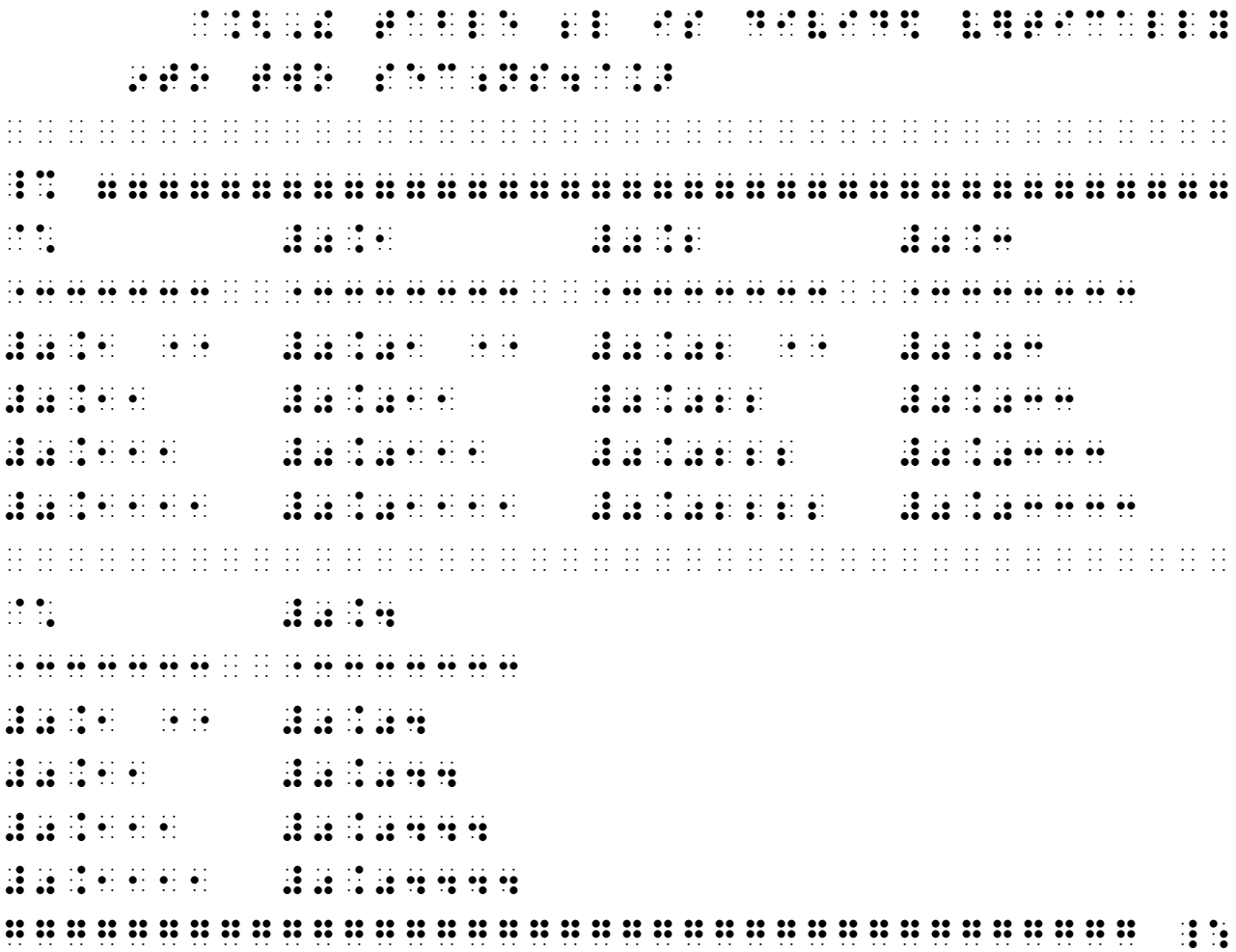


18.7.2 **Numeric Indicator Required.** This rule does not apply to tables whose entries include any of the following items, all of which are considered to be nonnumeric symbols. In such tables, the numeric indicator must be used throughout the table.

- words
- letters
- mathematical signs such as the dollar sign, percent sign, prime, fraction line, etc.
- a minus symbol
- a general omission symbol
- an ellipsis or a long dash
- guide dots within any column

Example 18-18

×	**0.1**	**0.2**	**0.3**	**0.4**
0.1	0.01	0.02	0.03	0.04
0.11	0.011	0.022	0.033	0.044
0.111	0.0111	0.0222	0.0333	0.0444
0.1111	0.01111	0.02222	0.03333	0.04444



Although this table will fit as printed if only one blank cell comes between columns and if the numeric indicators are omitted, because guide dots are needed in this table, numeric indicators are required throughout. The transcriber's note is required according to Braille Formats *guidelines.*

PRACTICE 18D

Instructions: Do not transcribe tables side by side even though they are printed in this manner. Each table should be preceded and followed by a top and bottom box line, with a blank line between boxes. Treat each table individually regarding code switching. If the body of the table can be transcribed entirely in UEB, do so.

Age	Height
24	5'3"
26	5'9"
30	6'1"
34	5'10"
35	5'4"

Age	Blood Pressure
24	108
26	104
30	122
34	119
35	128

Age	BMI
24	18.4
26	33.5
30	23.8
34	19.6
35	25.0

FIGURES AND DIAGRAMS

Teaching drawing techniques is beyond the scope of these lessons. Instructions for producing figures and diagrams are given in the BANA publication *Guidelines and Standards for Tactile Graphics*. The Nemeth transcriber should obtain a current copy of that publication. UEB methods for drawing lines in line mode are not to be used in a Nemeth transcription.

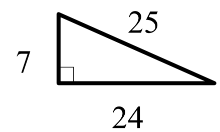
The examples in this section illustrate a few types of diagrams you may encounter in a typical math curriculum.

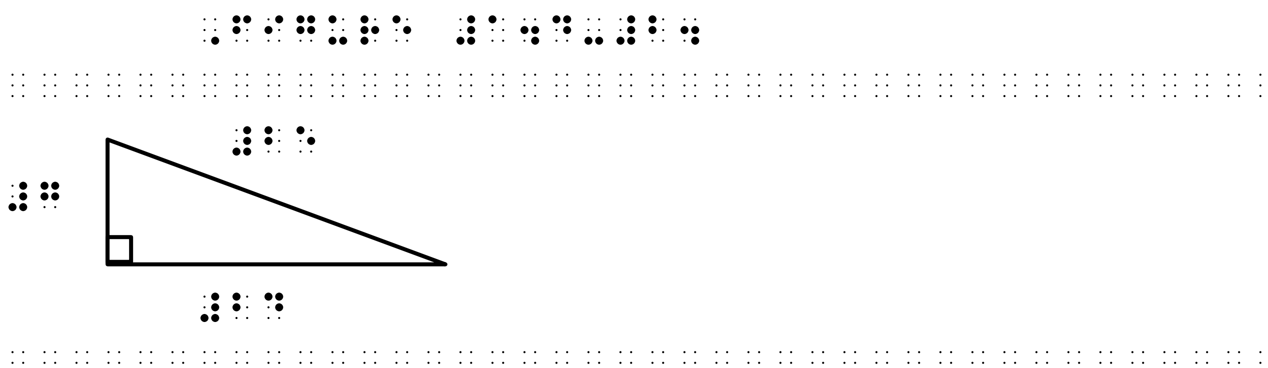
18.8 Which Code?

Numbered titles for figures and diagrams are transcribed in UEB. Diagram labels may not require a switch to Nemeth.

Example 18-19

Figure 1.4-2





These figure labels are transcribed in UEB because they are freestanding, unmodified numbers. A blank line precedes and follows the diagram.

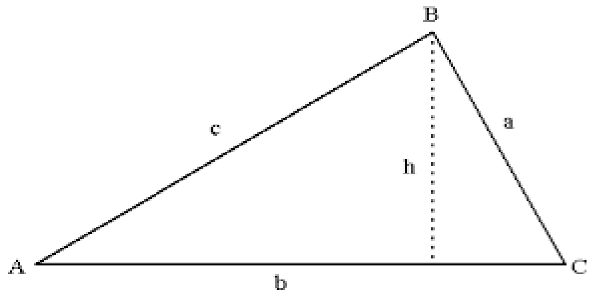
18.8.1 **Letters Used as Diagram Labels.** *Guidelines and Standards for Tactile Graphics* gives rules regarding diagram labels, for both UEB and Nemeth.

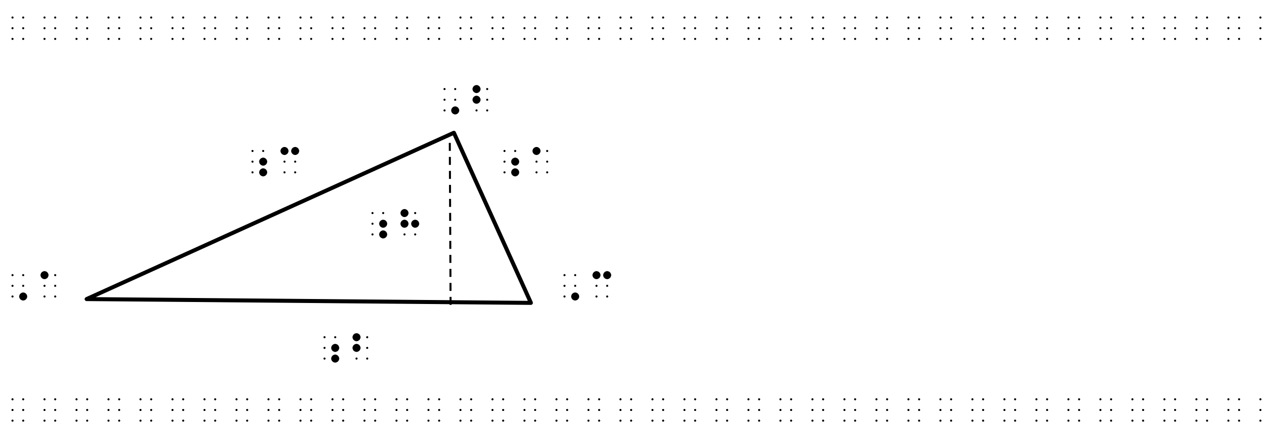
a. **Single Letters.** A single English letter used as a label requires a UEB grade 1 indicator or a Nemeth English-letter indicator when the letter is in lowercase. This includes letters a, i, and o in either code. The grade 1/English-letter indicator is omitted if the letter is capitalized.

b. **More Than One Letter.** A The rules differ for more than one letter, depending on the code in use with the diagram. In UEB, a grade 1 indicator is required when an uncapitalized combination of letters corresponds to a shortform (e.g., ab, cd). In Nemeth, the

English-letter indicator is not used for any letter combination in regular type. (See Section 3.16 in Lesson 3.)

Example 18-20





These figure labels are transcribed in UEB because they are freestanding, unmodified letters. The leftmost item in a diagram is placed in cell 1, regardless of the surrounding format.

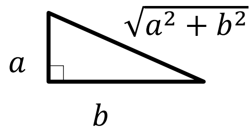
18.9 Switch Indicators and Tactile Graphics

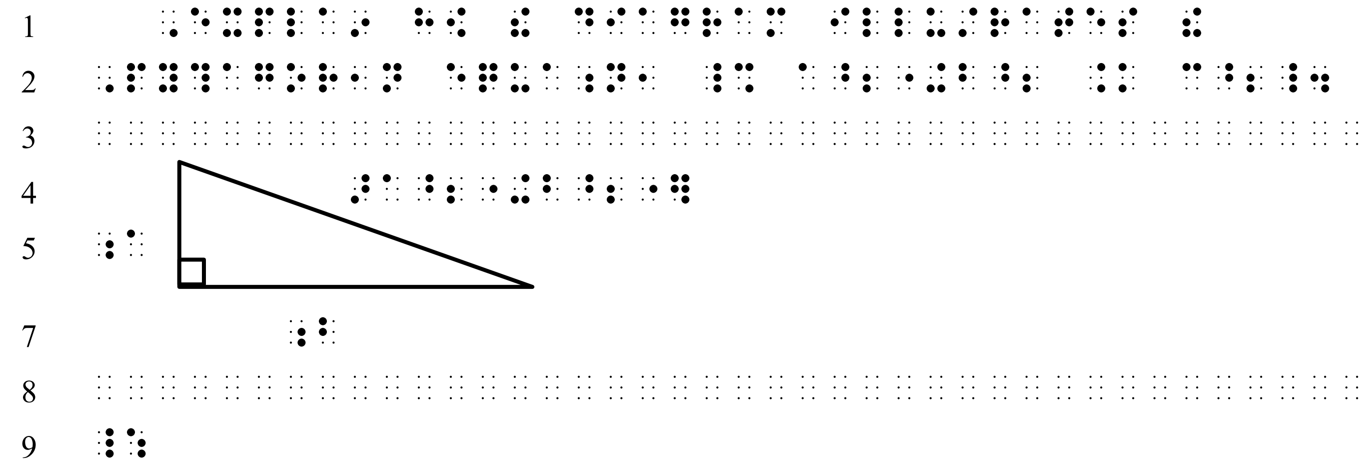
When a tactile graphic contains material that requires Nemeth, and when the preceding text is already in Nemeth, Nemeth continues to be in effect for the graphic. If the preceding text is in UEB and if a switch to Nemeth needs to be made for the tactile graphic, the opening switch indicator is placed at the end of the preceding text or in cell 1 on the line before the required blank line.

Note that displayed graphics begin in cell 1, as prescribed in *Guidelines and Standards for Tactile Graphics.*

Example 18-21

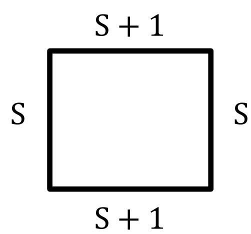
Explain how the diagram illustrates the Pythagorean equation, $a^2 + b^2 = c^2$.

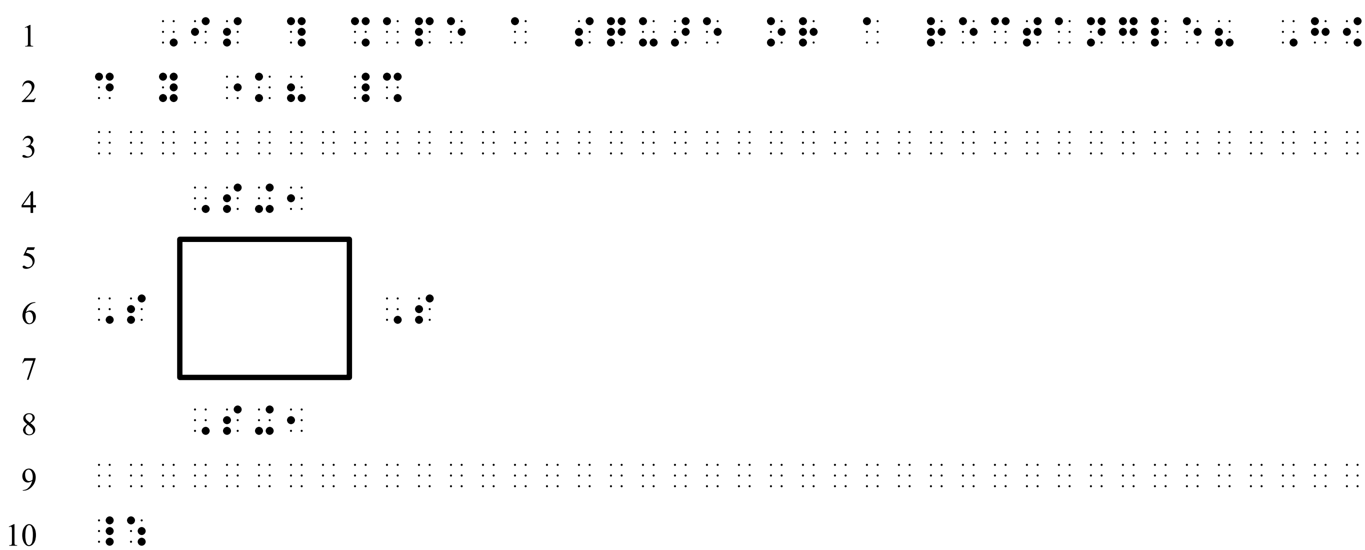




Example 18-22

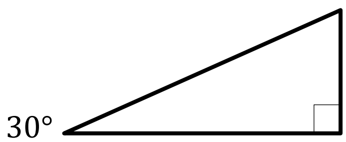
Is this shape a square or a rectangle? How do you know?

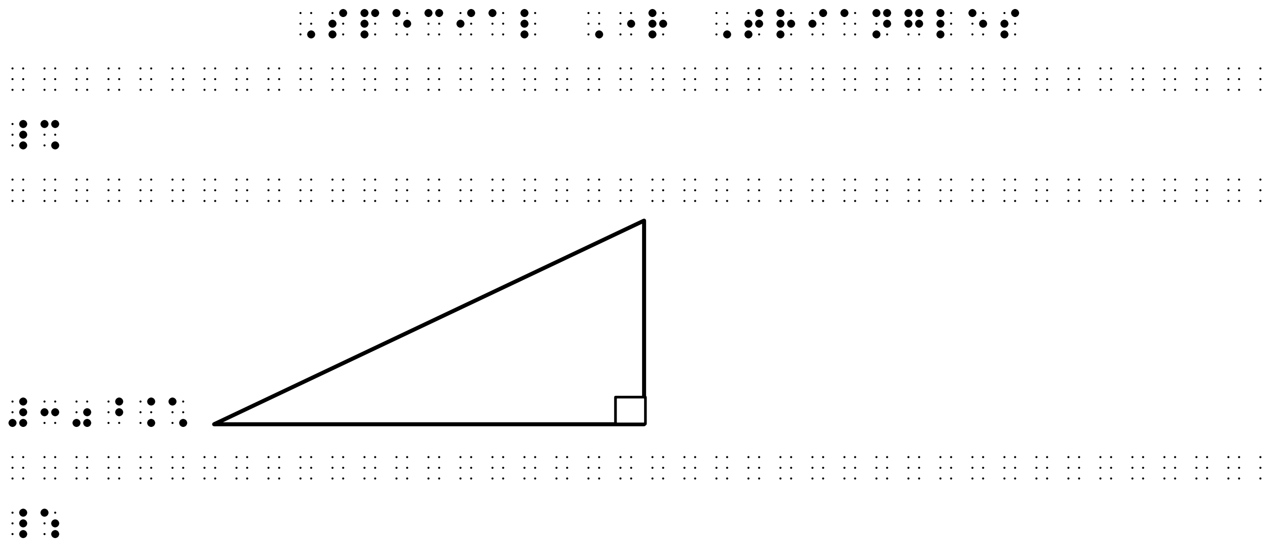




Example 18-23

Special Right Triangles



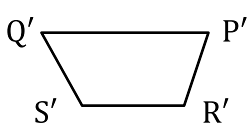


Note: Labels are placed in the same location as printed. When angle labels are placed inside of the diagram, the transcriber may opt to key those labels. Keying is discussed in *Section 18.13**. Examples can be found in* Guidelines and Standards for Tactile Graphics.

PRACTICE 18E

Instructions: Leave blank space for tooling the lines.

Raj transformed quadrilateral PQRS to form quadrilateral P′Q′R′S′.



18.10 Number Lines

There are many details to consider when transcribing a number line. Unit 6 of *Guidelines and Standards for Tactile Graphics* examines a variety of examples. Both UEB and Nemeth examples are shown. Be sure you are looking at the Nemeth example.

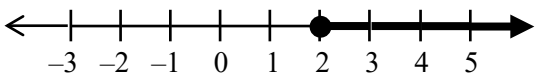
For kindergarten through grade 3, the number line must be produced as a tactile graphic. For grades 4 and up, braille symbols may be used to depict the number line. Symbols you may encounter on a number line can be found in Unit 6 of *Guidelines and Standards for Tactile Graphics*. Be sure to refer to the Nemeth symbols table, as the symbols are different in UEB.

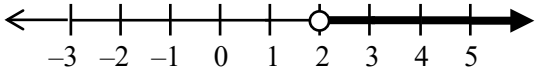
Here are the rules which are applied in the simple number line illustrated in Example 18-24.

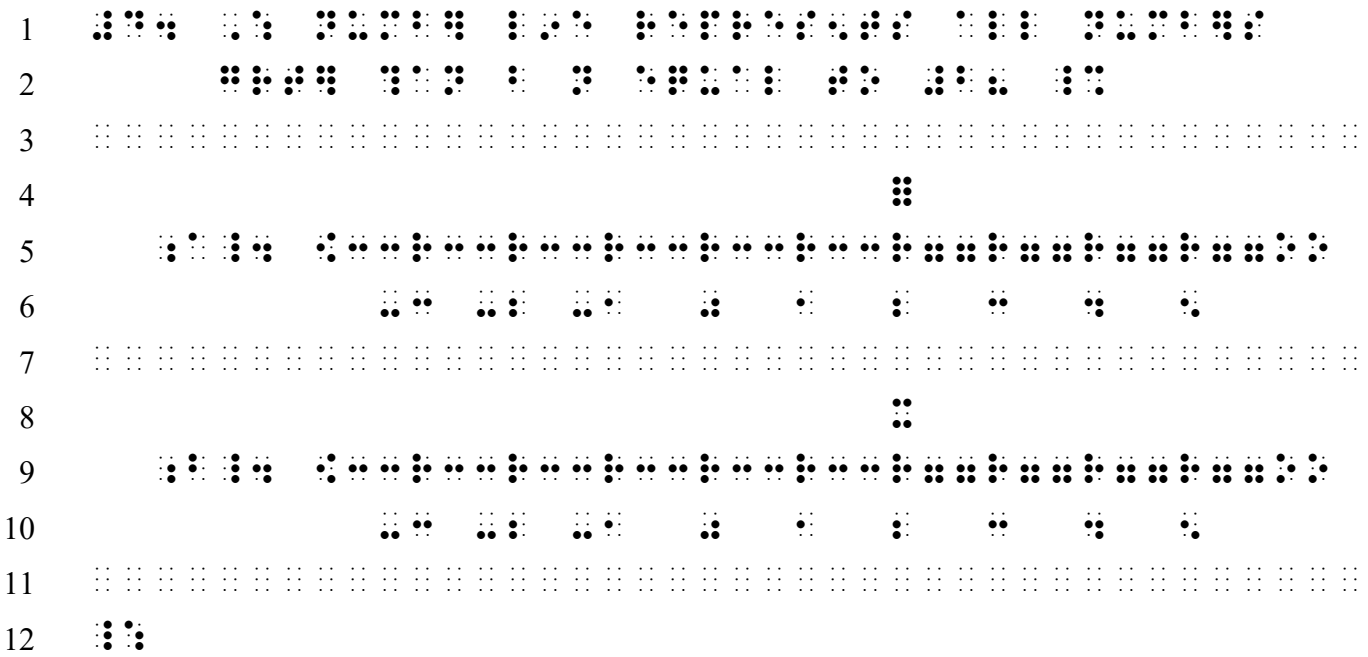
- A number line is transcribed in Nemeth. Because it is a spatial construction, it is preceded and followed by a blank line, and the rules for placement of code switch indicators around a spatial arrangement are followed.
- For a number line with no identifier, the leftmost cell of the construction is placed at the margin, in cell 1. Runovers begin in cell 3.
- For a number line with an associated identifier, the construction may begin on the same line if it fits. If the number line requires more room than is available, it is placed at the margin, in cell 1, after the required blank line.
- Arrowheads at the end or ends of a number line are included, if shown in print.
- The proportional spacing between units must be preserved.
- *Numeric scale labels*: Scale labels are transcribed below the number line, regardless of their placement in print. The numeric indicator is omitted. The first digit is aligned with the scale mark, whether or not the label is preceded by a plus or minus sign.
- *Plotted points*: A plotted point on a number line is placed above the number line, regardless of its placement in print.
- *Bold line, bold arrowhead*: Bold lines and arrowheads are incorporated into the number line, regardless of their placement in print.

Example 18-24

4. Which number line represents all numbers greater than but not equal to 2?

a. 

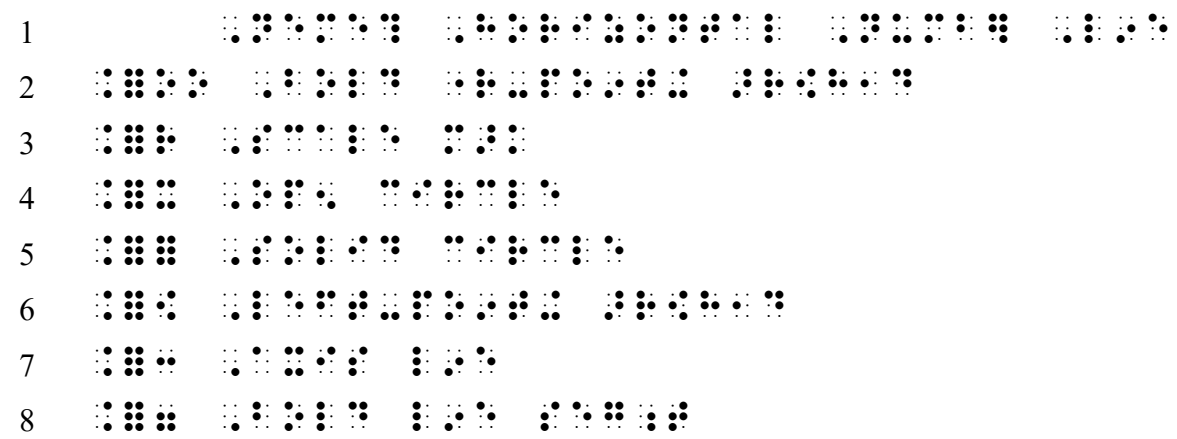
b. 



Lines 5 and 9: The scale marks are embedded in the braille number line.
Lines 5 and 9: The scale marks are equidistant.
Lines 6 and 10: The digit of each negative number is aligned with its scale mark.
Lines 5 and 9: The bold arrow shaft and its arrowhead are superimposed on the number line.
Lines 4 and 8: The plotted point (open or solid circle) is transcribed on the line above the number line.

18.10.1 **Special Symbols Page.** Number line symbols must be listed on the Special Symbols page. After the completion of the UEB symbols list , the number line symbols are listed in braille order under a cell-5 heading, "Nemeth Horizontal Number Line". Example 18-25 lists the symbols used in Example 18-24.

Example 18-25



PRACTICE 18F

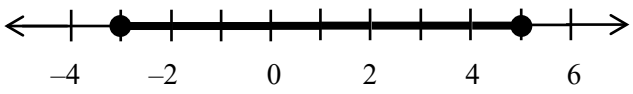
Instructions: Create a Special Symbols page for Practice 18G. The symbol for the right-pointing arrowhead in the number line is (135).

PRACTICE 18G

Instructions: Center the heading on line 1. Include the print page number 18–29. Number the braille page 1 on line 25.

REAL NUMBERS

Bass drew a number line to represent all real numbers between, and including, –3 and +5.



18.11 Diagrams in Exercise Material

If a diagram, number line, or other graphic is placed between instructions and the itemized exercise material which follows, apply the spacing and margin rules for the graphic as outlined in *Guidelines and Standards for Tactile Graphics*. Then continue Nemeth formatting for the exercise material.

18.12 Molecular Diagrams

Transcribing chemical notation requires further study and is beyond the scope of this lesson manual. Refer to *Chemical Notation Using the Nemeth Braille Code* for rules and guidance.

KEYING TECHNIQUE

[NC 26.9]

18.13 Keying

When space does not permit the inclusion of labels, column or row headings, entries, etc., in a figure, in a table, or in an array, one or more of the labels, headings, entries, etc., may be keyed. A keyed item consists of two or three cells made up of letters, numbers, or a combination of letters and numbers. The key items are placed in the same position as the material which they replace. Two items which are identical will have the same key assigned to them.

Keep in mind that keyed items add an extra step for the reader. The technique of keying should not be relied upon as a catch-all technique when other methods may be available. Judicious use of keying can be a good solution after other strategies fail to give a clear presentation.

In addition to the keying guidelines outlined in *Braille Formats* and in *Guidelines and Standards for Tactile Graphics*, the following rules apply in Nemeth.

18.13.1 **Alphabetic Key.** An alphabetic key consists of two or three lowercase English letters. At least one cell of a two- or three-letter key must contain dot 3 or dot 6. The letter combination should be suggestive of the item it represents, if possible. Quoting *Braille Formats*, "Keys work best when they are related to the terms used in the text to help the reader remember what they are. Typically a letter key will be more memorable for the reader."

An alphabetic key cannot be used if any items remaining in the figure, determinant, matrix, or table are made up of two or three lowercase letters. In that case, a numeric key is used.

18.13.2 **Numeric Key.** A numeric key consists of one or two digits transcribed in the upper part of the braille cell, preceded by the numeric indicator. There must not be punctuation associated with a key number.

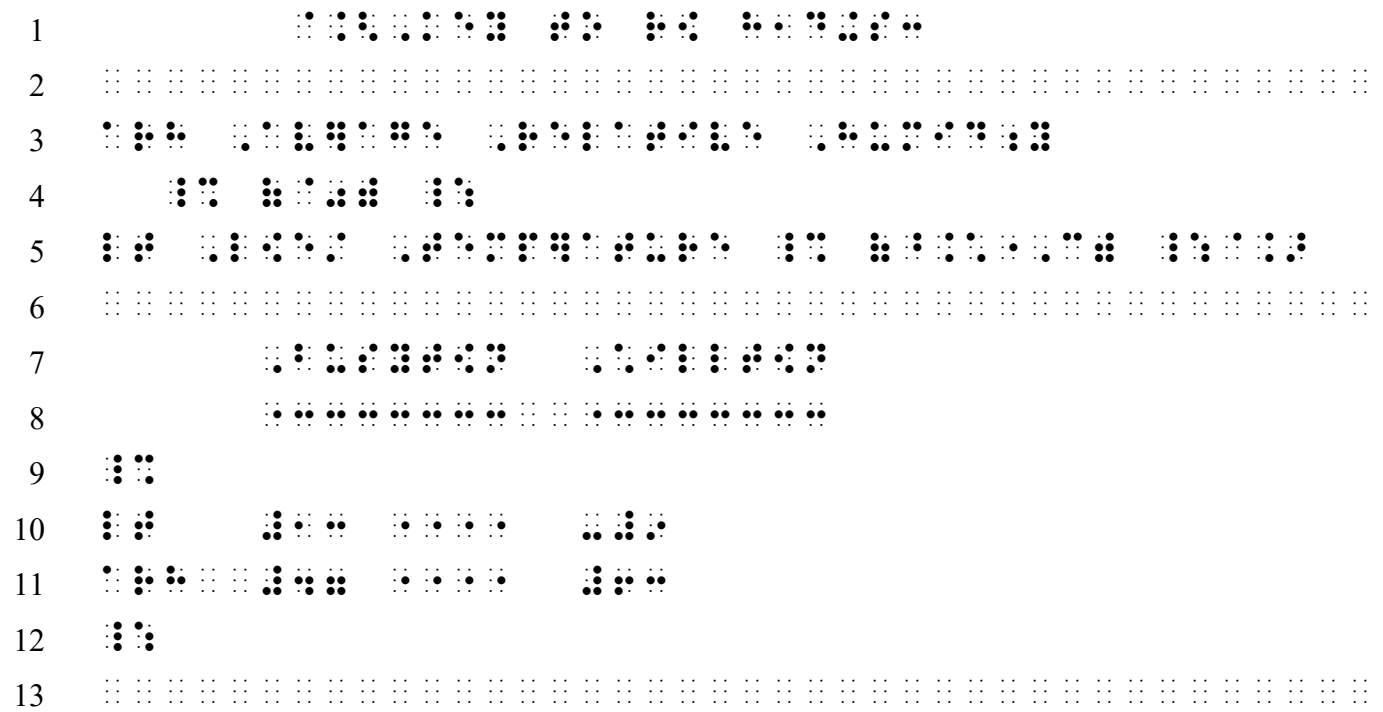
18.13.3 **Combination Key.** The combination of letters and numbers must not exceed three cells. One of the symbols must contain dot 3 or dot 6.

18.13.4 **The Key List.** A list of numeric and/or alphabetic keys and their meanings is given in a transcriber's note. Letter keys are usually listed in alphabetic order, but may, if appropriate, be listed in order of appearance (see *Braille Formats*). Number keys are listed in numeric order. In a circle graph, the keyed items are listed in clockwise order, starting at the top, as outlined in *Guidelines and Standards for Tactile Graphics.* See Example 18-28.

If the last item in the key listing is in Nemeth, Nemeth must be terminated before closing the transcriber's note.

Example 18-26

	Busytown	Chilltown
Lowest Temperature (°C)	13	−9
Average Relative Humidity (%)	47	63

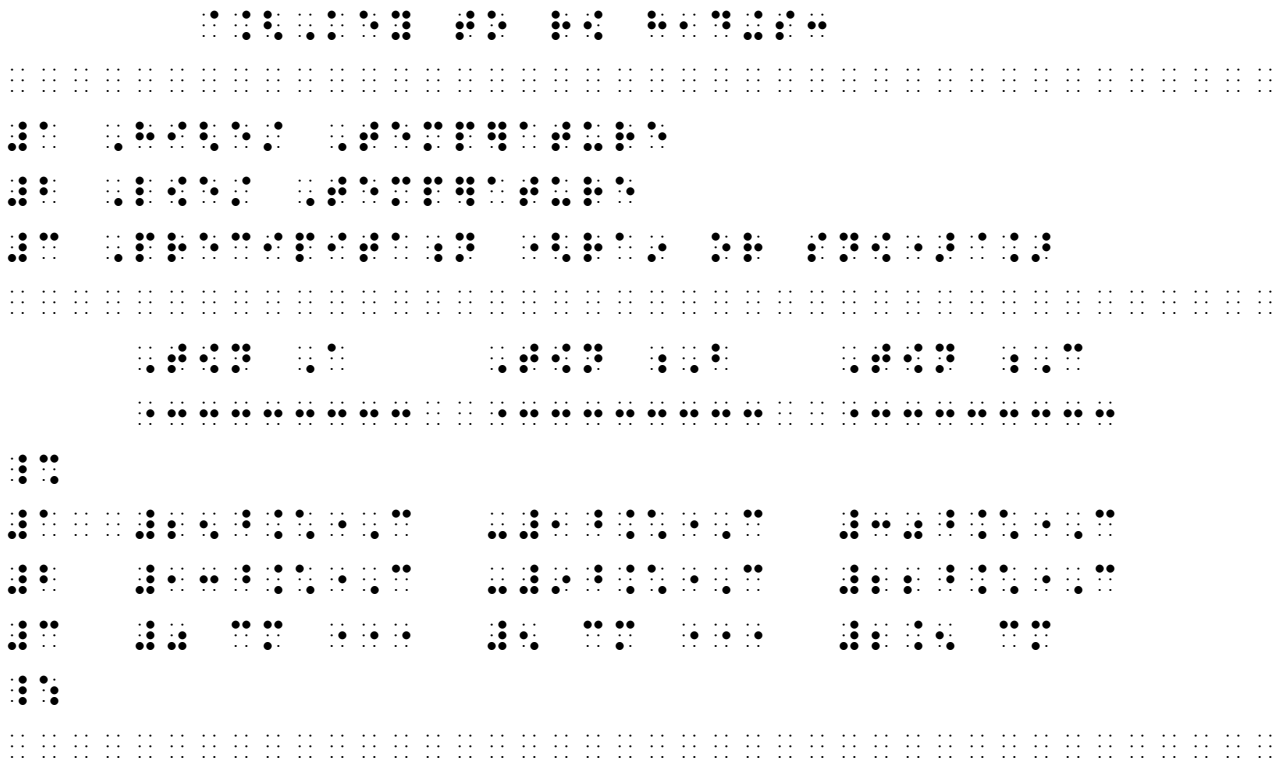


Line 1: The transcriber's note "Key to row headings:" begins in cell 7.
Line 2: A blank line precedes the key list.
Lines 3-5: An alphabetic key provides the reader with clues regarding each item's meaning. The key is listed in alphabetical order. Each letter combination is followed by one space and then the words it replaces.
Line 6: A blank line follows the key list.
Lines 7-8: The column headings and column separation lines with two blank cells between them.
Line 9: The opening Nemeth Code indicator is in cell 1.
Lines 10-11: A negative number in the body of the table requires Nemeth. To avoid code switching within the body of the table, all of the entries are in Nemeth. Numerals are left-aligned, as printed.
Line 12: The Nemeth Code terminator is in cell 1.
Line 13: A blank line follows the table.

Example 18-27

	Town A	Town B	Town C
Highest Temperature	25°C	−1°C	30°C
Lowest Temperature	13°C	−9°C	22°C
Precipitation (rain or snow)	0 cm	5 cm	2.5 cm

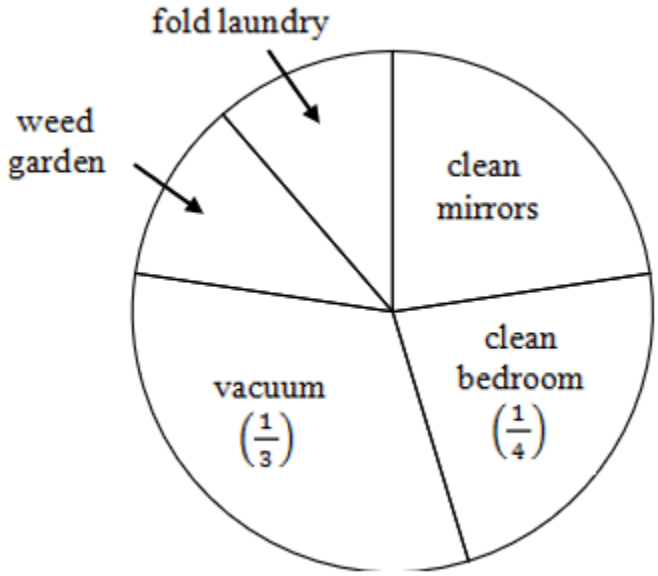
1
2
3
4
5
6
7
8
9
10
11
12
13
14



The row headings are keyed. Because there are entries in the table consisting of two lowercase letters ("cm"), a numeric key must be used.

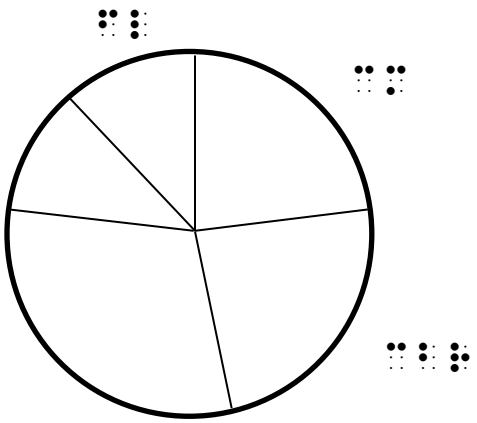
Example 18-28

ADYLYN'S CHORE SPINNER



Adylyn hopes she will spin *either* "vacuum" *or* "weed garden" today. What is the probability that she will spin one of these chores?

- What is P(vacuum)?
- What is P(weed garden)?
- What is P(vacuum) OR P(weed garden)?



[next page]

(Commentary is on the next page)

Page 1

Lines 1-2: Centered heading and blank line following.

Lines 3-4: The transcriber's note "Key to labels:" begins in cell 7. A blank line precedes the key list.

Lines 3-9: An alphabetic key provides the reader with clues regarding each item's meaning. The key is listed in clockwise order as stipulated in Guidelines and Standards for Tactile Graphics.

Line 7: "clean bedroom" cannot use the key letters "cb" because there is no dot 3 or dot 6 in that letter combination. "cbr" is chosen to represent "clean bedroom".

Lines 10-19: The graphic is drawn, and the labels are placed outside of the graph as outlined in Guidelines and Standards for Tactile Graphics.

Page 2

Lines 5-8: Bulleted items follow guidelines given in Braille Formats. The probability notation is mathematical. Nemeth switch indicators are used, and words are not contracted.

PRACTICE 18H

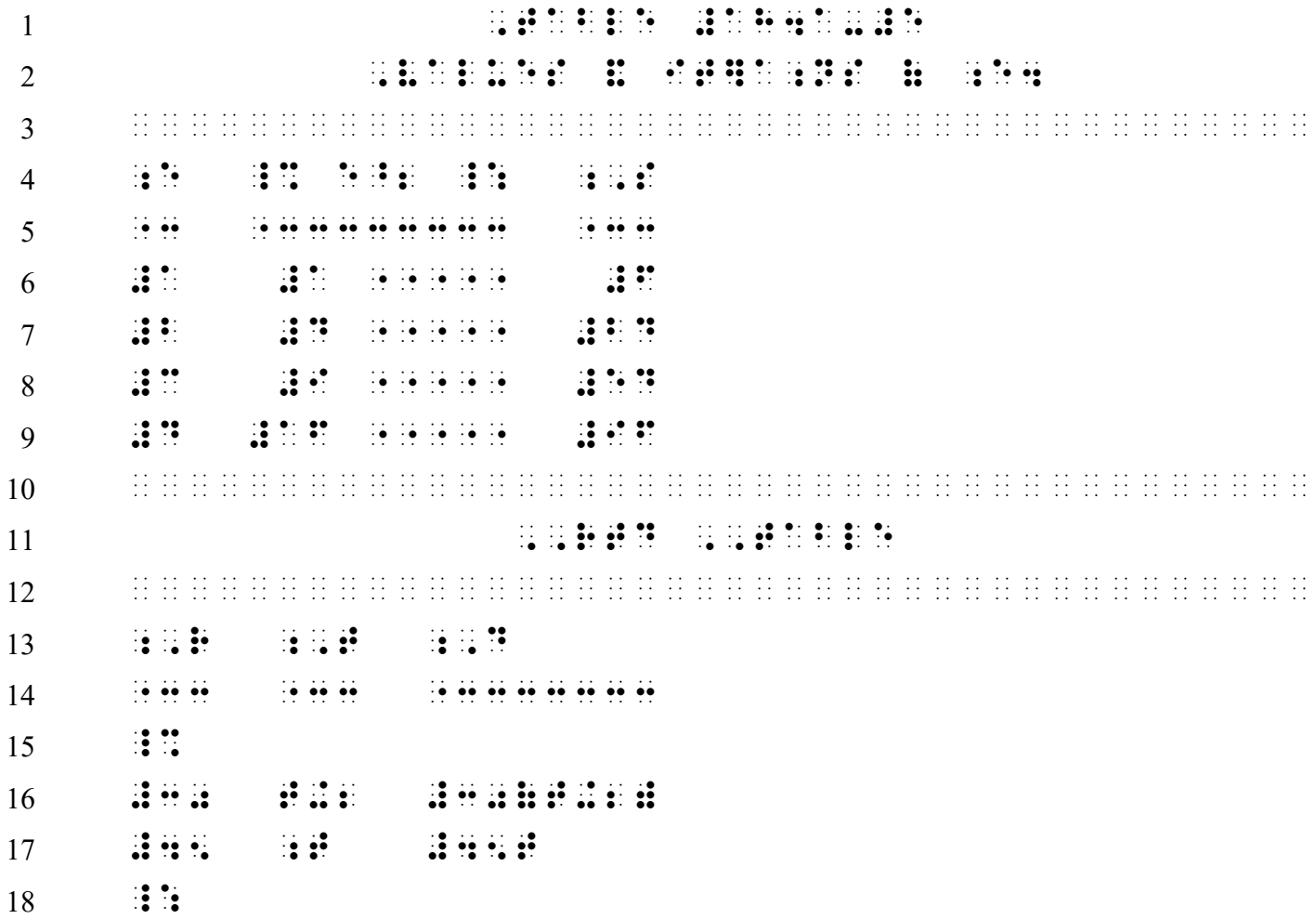
Substance	**Melting Point** (°C)	**Boiling Point** (°C)	**Heat of Fusion** (kJ/kg)	**Heat of Vaporization** (kJ/kg)
Aluminum	660	2467	396	10500
Ammonia	−78	−33	332	1370
Lead	328	1740	25	866

Submit Exercise 18 to your instructor.

BLANK PAGE

ANSWERS TO PRACTICE MATERIAL

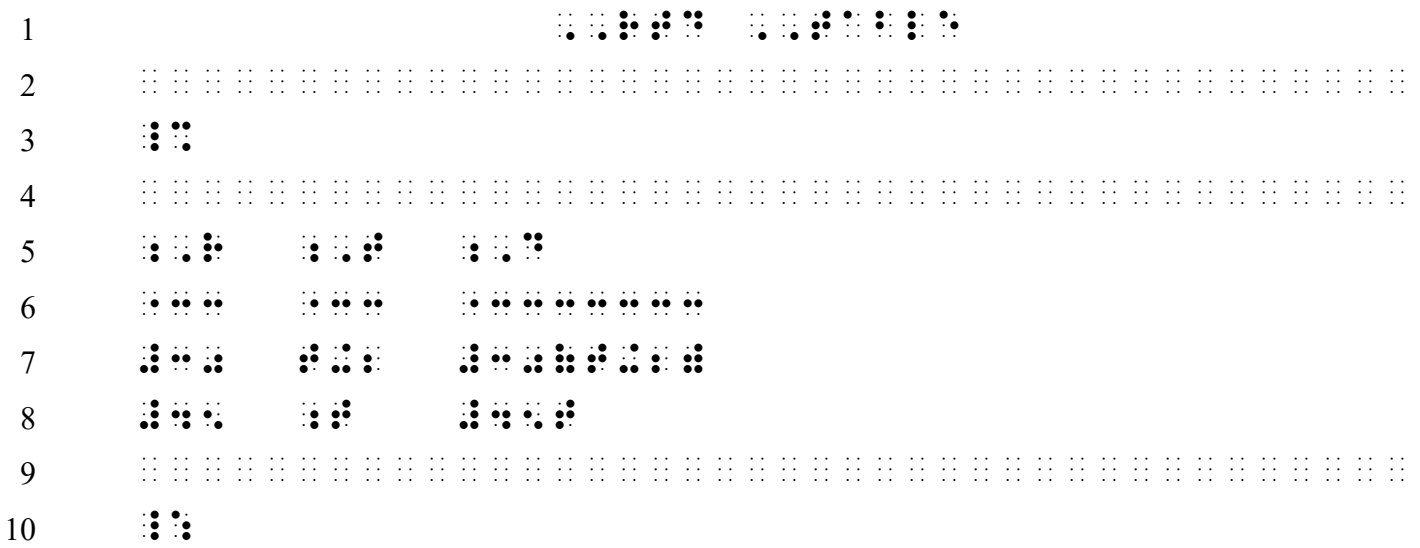
PRACTICE 18A



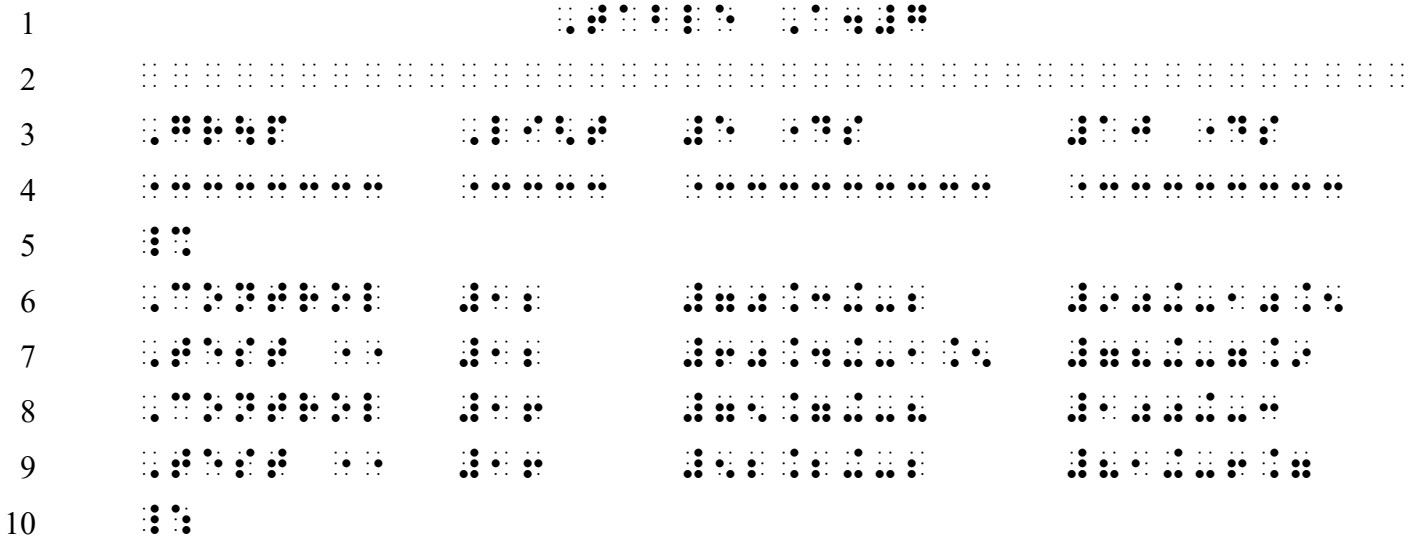
In the first table, only the heading for column two requires Nemeth. Although the first table could just as well be transcribed entirely in Nemeth, the instructions to the practice said to transcribe the body in UEB if possible.

(See the alternate transcription of the RTD table on the next page.)

PRACTICE 18A, RTD TABLE, alternate transcription



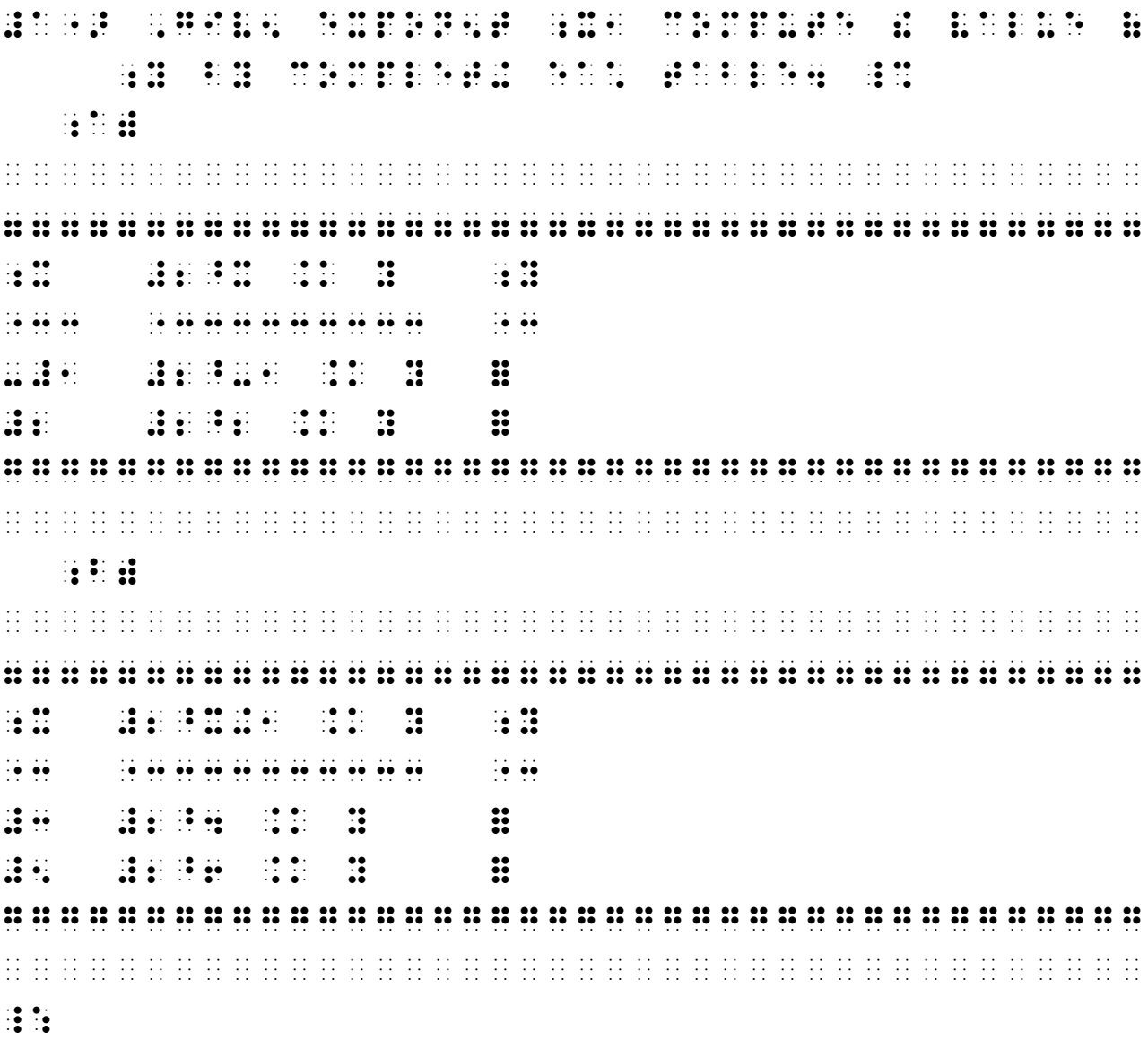
PRACTICE 18B



The table label and column headings are transcribed in UEB. The row headings are part of the technical material and are uncontracted. The single-word switch indicator is not used.

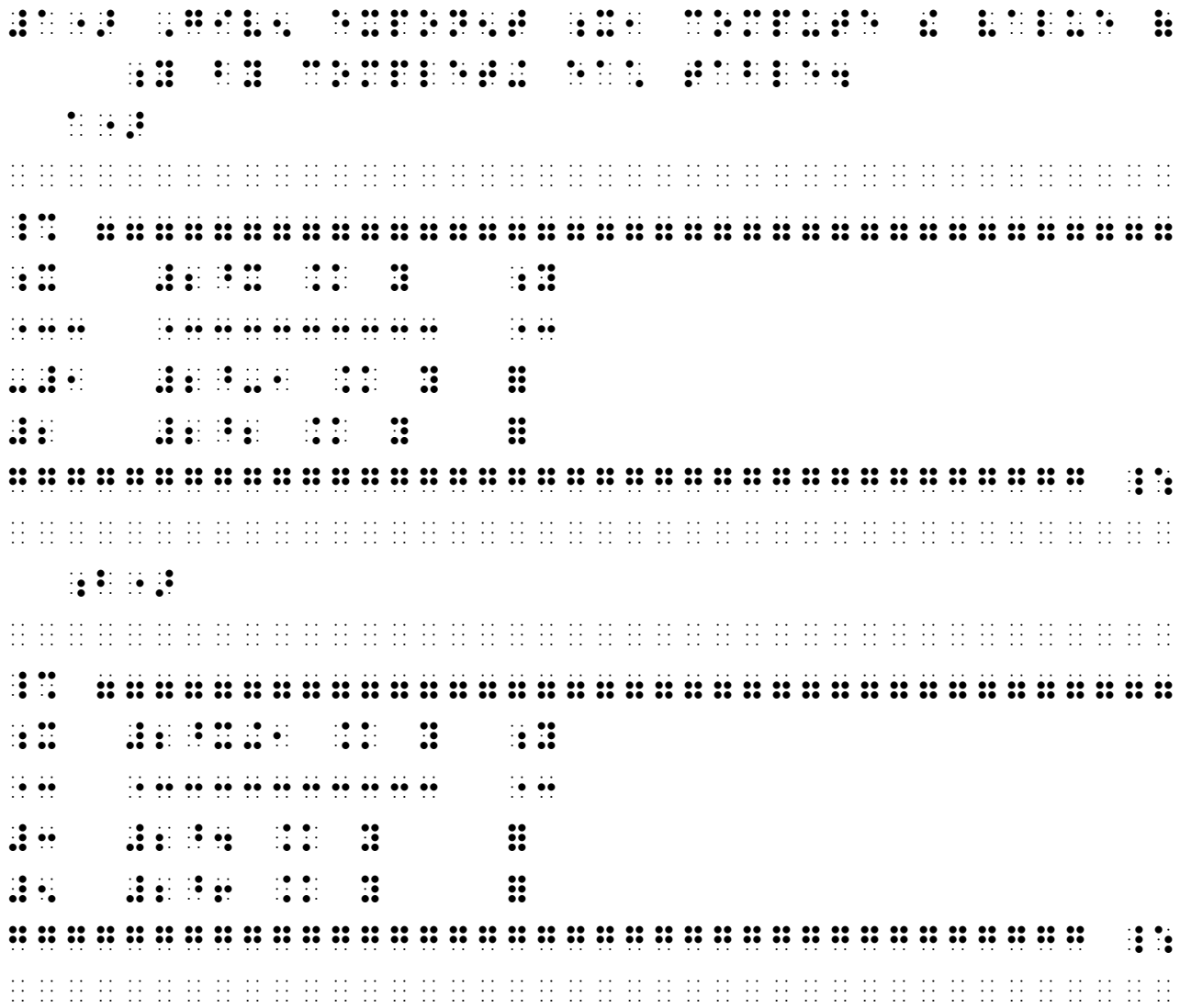
PRACTICE 18C

Two transcriptions are shown. Either transcription is viable.



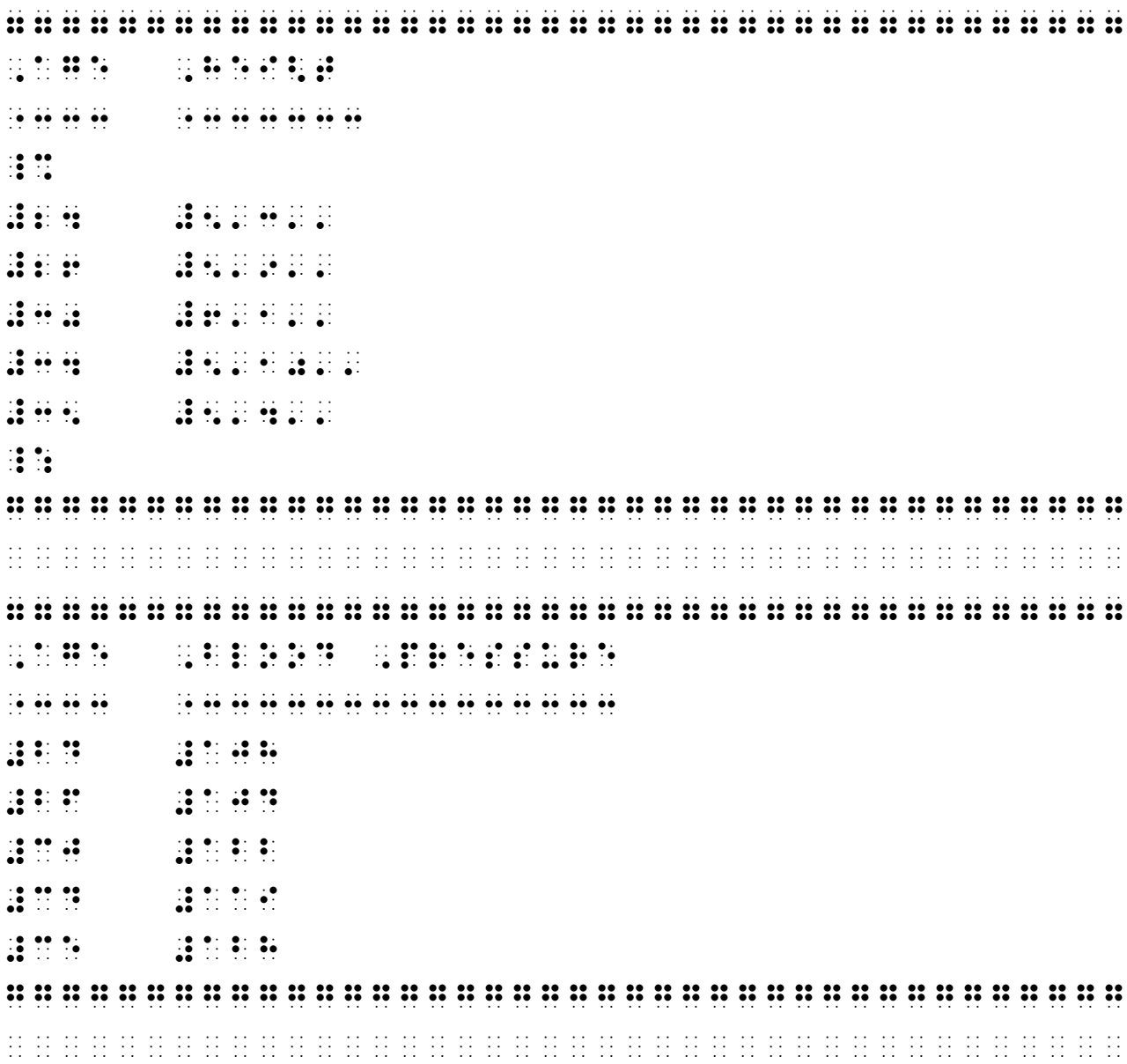
Formatting Notes*:* Subdivision identifiers begin in cell 3. Column 1 begins in cell 1. Box lines use the full width of the page. Boxes are preceded and followed by a blank line. In column 3, the general omission symbol represents the question mark. The opening Nemeth Code indicator precedes the identifier "a)". Nemeth is terminated after the completion of the table. Box lines match —since the top box line does not incorporate a switch indicator, the Nemeth Code terminator is not part of the bottom box line.

PRACTICE 18C, alternate transcription



Formatting Notes*:* Subdivision identifiers begin in cell 3. Column 1 begins in cell 1. Box lines use the full width of the page. Boxes are preceded and followed by a blank line. In column 3, the general omission symbol represents the question mark. The opening Nemeth Code indicator and Nemeth Code terminator are incorporated into each of the top and bottom box lines. Each subdivision identifier is in UEB.

PRACTICE 18D



Lines 4-10: The presence of prime signs in the first table dictates Nemeth. The opening Nemeth Code indicator is placed alone on line 4; the Nemeth Code terminator is placed alone on line 10.

Lines 16-20: The numbers in the second table can be transcribed in UEB.

PRACTICE 18D, continued

```
1   ⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶⠶
2   ⠠⠁⠛⠑  ⠠⠠⠃⠍⠊
3   ⠐⠒⠒⠒  ⠐⠒⠒⠒⠒
4   ⠸⠩
5   ⠼⠆⠲   ⠼⠂⠦⠨⠲
6   ⠼⠆⠖   ⠼⠒⠒⠨⠢
7   ⠼⠒⠴   ⠼⠆⠒⠨⠦
8   ⠼⠒⠲   ⠼⠂⠔⠨⠖
9   ⠼⠒⠢   ⠼⠆⠢⠨⠴
10  ⠸⠱
11  ⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛⠛
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Lines 4-10: Nemeth is required because the entries contain decimal points.
Lines 5-9: Numeric indicators are used because, although the data is composed entirely of numbers, saving space is not a consideration.
Line 10: The Nemeth Code terminator is placed alone on the line following the last entry, before the bottom box line.

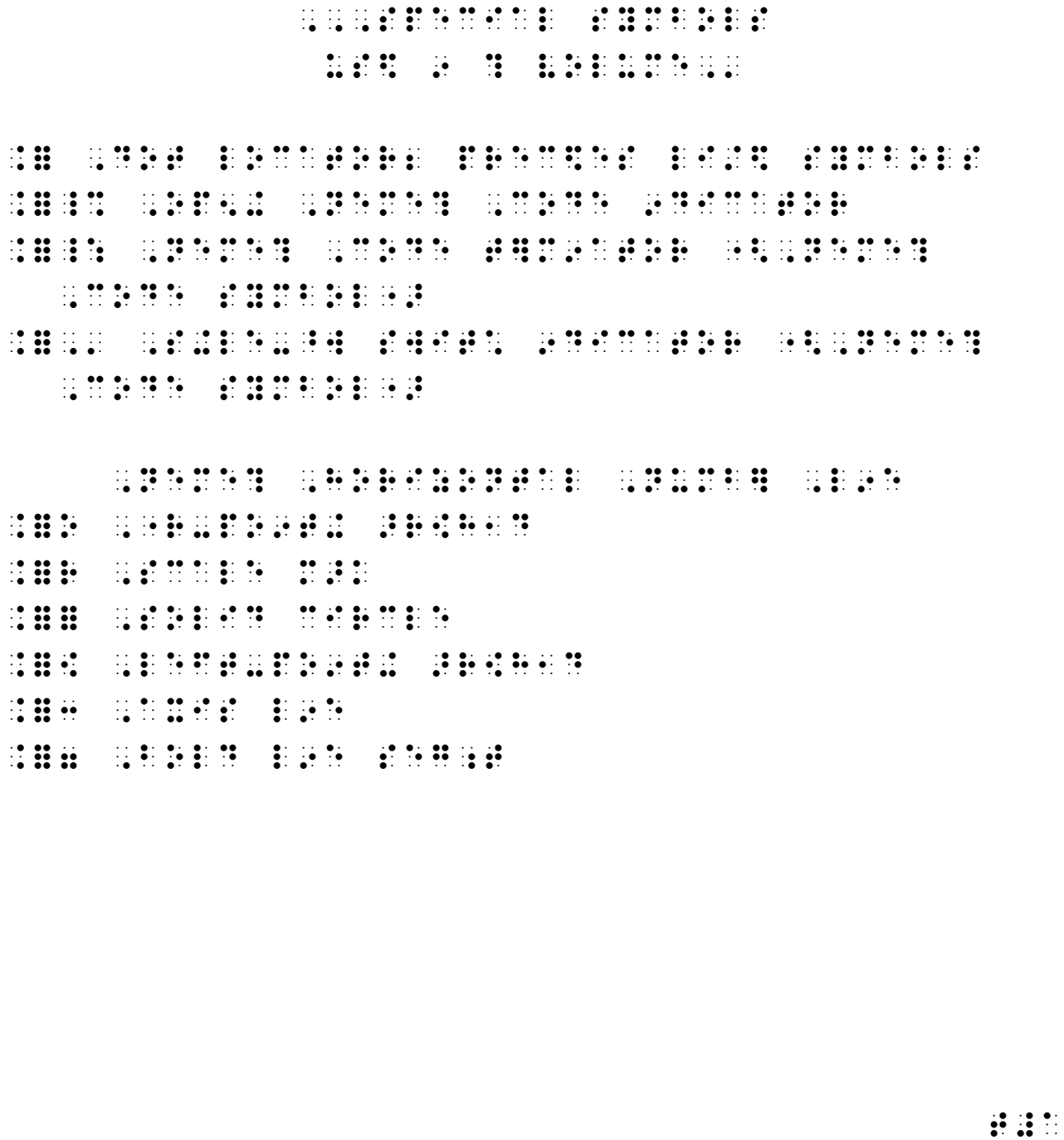
PRACTICE 18E

```
1     ⠠⠗⠁⠚ ⠞⠗⠁⠝⠎⠿⠍⠫ ⠟⠥⠁⠙⠗⠊⠇⠁⠞⠻⠁⠇
2   ⠸⠩ ⠠⠏⠠⠟⠠⠗⠠⠎ ⠸⠱ ⠞⠕ ⠿⠍ ⠟⠥⠁⠙⠗⠊⠇⠁⠞⠻⠁⠇
3   ⠸⠩ ⠠⠏⠄⠠⠟⠄⠠⠗⠄⠠⠎⠄⠸⠲
4   ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀
5   ⠠⠟⠄         ⠠⠏⠄
6
7    ⠠⠎⠄       ⠠⠗⠄
8   ⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀⠀
9   ⠸⠱
```

The presence of prime symbols in the quadrilateral's labels requires Nemeth.
Nemeth is terminated after the required blank line following the graphic.

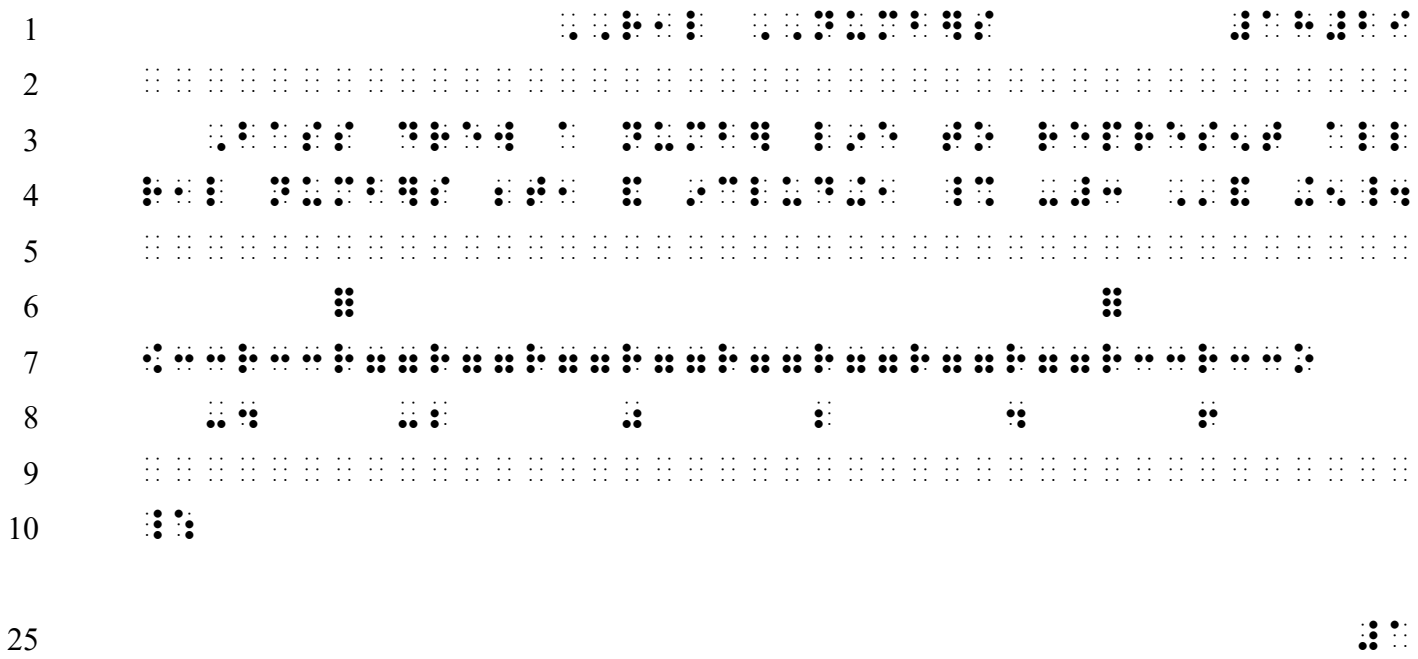
PRACTICE 18F

Special Symbols page



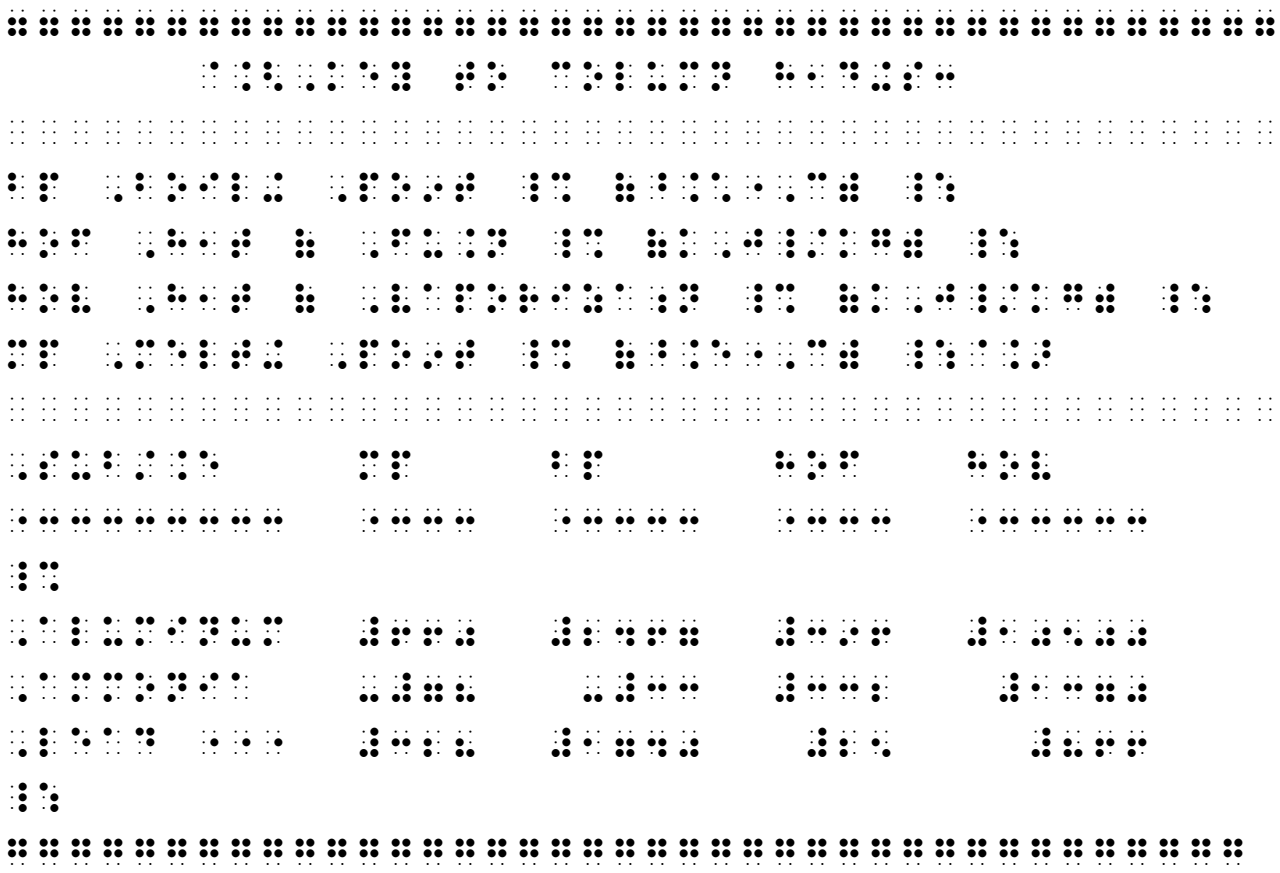
Lines 6-9: The Nemeth Code terminator and single-word switch indicator are listed in the main part of the symbols list even though they are Nemeth symbols.
Lines 11-17: Nemeth number line symbols are listed in a separate section.

PRACTICE 18G



Line 7: The number line begins in cell 1. See Section 18.10, second bullet.

PRACTICE 18H



Other key choices are possible. "hof" was chosen here because "hf" cannot be used (it lacks lower dots); "hov" was chosen to mirror "hof" for easier recognition. The data are all transcribed in Nemeth. The row headings are uncontracted because they occur within the Nemeth switches.