AN INTRODUCTION TO BRAILLE MATHEMATICS USING UEB WITH NEMETH
A Course for Transcribers

FINAL LESSON

- Preparing for the Certification Exam
- Structuring a Textbook
- Four Practices

Answers to Practice Material

This is the final lesson but in no way is it the end of your training. As this book's title states, this is an introduction to the Nemeth braille code. In your work you will encounter symbols and usage that will require creative and consistent application of the rules. Each new assignment will present challenges. As you research answers, your understanding of the rules and guidelines will develop.

F1 Preparing for the Certification Exam

The topics addressed in this lesson are offered to help the transcriber who is preparing for the certification exam. A combination of textbook format guidelines from Braille Formats as well as Nemeth formats are to be applied to the practice material. The student can gauge their readiness for the exam by checking their work in the Answers section. There is no exercise to turn in for this lesson.

F2 The Nemeth Code Book

The Nemeth Braille Code For Mathematics and Science Notation should become your primary source for transcribing technical materials. Subject matter from several of the lessons in this training manual may be grouped into one section in the code book, giving new perspective and understanding of a topic or rule.

To get started, read the following "use/nonuse" sections in the Nemeth code book. Review the rules, study the examples, and follow the cross references.

<table>
<thead>
<tr>
<th></th>
<th>Use of</th>
<th>Nonuse of</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capitalization indicator</td>
<td>5.1</td>
<td>5.2</td>
</tr>
<tr>
<td>English-letter indicator</td>
<td>6.3, 10.3</td>
<td>6.4</td>
</tr>
<tr>
<td>Enlarged grouping symbol</td>
<td>19.6</td>
<td>19.7</td>
</tr>
<tr>
<td>Level indicator</td>
<td>14.9</td>
<td>14.10</td>
</tr>
</tbody>
</table>
Review situations when we do not follow print layout

Here is a sampling of situations for which the Nemeth Code has specific rules regarding spacing and arrangement on the braille line. Centering: cancellation, spatially arranged fractions. Spacing: abbreviations, factors in math expressions, math symbols, functions, alignment of items in spatial arrangements. Linage: "keep together" rules (an abbreviation and its associated numeral or letter, abbreviated function names, hyphenated expressions, signs of shape), division of long math expressions, side-by-side arrangements (e.g., itemized, unitemized, displayed, spatial). Margins: formal proofs, instructions, itemized material, mathematical statements, linked expressions, paragraphing.

Revisit rules which you find to be troublesome

For example, review the various forms of fractions, the many uses of the multipurpose indicator, correct assessment of ambiguous mathematical signs, and the use of literary punctuation for words and abbreviations in mathematical context.

Back matter

Familiarize yourself with Appendix B of the Nemeth Code which offers a useful index of braille symbols. Skimming the General Index is a good way to reinforce the vocabulary and terminology used in the Nemeth braille code.

Review code switching guidelines

The only time Nemeth symbols and indicators may be used is within the switch indicators. Review guidelines regarding when code switching is optional and when it is required, as well as considerations concerning placement of the switch indicators in embedded material, displayed material, spatial material, and at page turns. A summary appears in Appendix C of this course.
F3 Beyond the Nemeth Code

Every aspect of the Nemeth Code has been introduced in this course. Certification in this code implies that you are prepared to transcribe a textbook which contains mathematical notation. This requires knowledge of the structure of a braille textbook as well as how the Nemeth Code cooperates with textbook formatting and the rules of Unified English Braille. Format guidelines which apply to the structuring of a textbook are in the BANA publication Braille Formats: Principles of Print-to-Braille Transcription. The transcriber should be thoroughly familiar with that resource as well as the other sources listed below. These documents are available online at www.brailleauthority.org and https://iceb.org/ueb.html. Keep up to date as newer editions or updates are posted.

The editions listed below are current at the time of this writing. The Practice answers and commentary in this lesson may become outdated when future editions of these resources become available. Please contact us at transcribers@nfb.org if you find this lesson is not up to date.


*Braille Formats: Principles of Print-to-Braille Transcription, 2016 and the 2016 Addendum*

*The Nemeth Braille Code for Mathematics and Science Notation, 2022*

This course does not address topics regarding creating a tactile graphic. A thorough reading of Guidelines and Standards for Tactile Graphics is recommended before undertaking a technical transcription that contains diagrams. Strategies presented in this resource include 2-D and 3-D drawings, clocks (analog and digital), complex geometric shapes, counting symbols, graphs (circle graphs, bar graphs, line graphs, histograms, Cartesian graphs, pictographs, pie charts, scatter plots, line or dot plots, box-and-whisker plots), measurement tools, money, nets, number lines, orthographic drawings, spinners, tessellations, thermometers, and Venn diagrams.

This course does not address topics pertaining to chemistry notation and chemical diagrams. Refer to Chemical Notation Using the Nemeth Braille Code when transcribing a chemistry assignment.

Symbols, arrangements, and structures not covered in the courses and code books are frequently encountered when preparing assignments. Many excellent materials have been shared and distributed by transcriber organizations. Professional development resources and online forums can be an excellent way to familiarize yourself with the finer points of code switching, formatting, division of expressions, and other topics for which experience is the best teacher. However, be aware that workshop materials may be outdated or may contain errors. They may contain strategies that are not supported by rules of the braille codes. For these reasons workshop materials should not be used or referenced as sources of information when preparing your certification exam.
Structuring a Textbook

F4  Transcriber-Generated Pages and Front Matter

Before transcribing the first page of text, certain transcriber-generated and front matter pages are required. Review the guidelines for the transcriber-generated pages (title pages, special symbols page, and transcriber's notes page) in Section 2 of *Braille Formats 2016*. You may also wish to review the lesson on "Braille Book Format" in the most recent edition of the *Instruction Manual for Braille Transcribing – UEB Edition*.

F4.1  Title Page. Use the following statement in the Transcriber/Transcription segment:

"Transcribed ___(year) into Unified English Braille with Nemeth by ___(Your Name)"

F4.2  Special Symbols Page. The heading for this "t" page is SPECIAL SYMBOLS USED IN THIS VOLUME. Follow the guidelines in Appendix G of *Braille Formats 2016* to select UEB symbols that should be included. Disregard the UEB math symbols given in that list since UEB math symbols are not used in a Nemeth transcription. List the UEB symbols that appear throughout the volume, including any that may occur on the title page.

The Nemeth code switch indicators are to be included in the list, following braille order, as explained in Section 1.1.2 of *The Rules of Unified English Braille*. The phrase “(Nemeth Code symbol)” should follow the definition of both the Nemeth Code terminator and the single-word switch indicator. Other Nemeth symbols are not listed on the Special Symbols page unless they are symbols devised by the transcriber.

Here is a model, showing a few UEB symbols as well as the three switch indicators. Additional symbols will be inserted into the model as needed in each braille volume.

```
SPECIAL SYMBOLS
US$ 9 VOLUME

DOT LOCATORS, PREACES, LIST SYMBOLS
\text{\textcopyright} OPEN, \text{\textregistered} SPECIAL SYMBOLS
\text{\textcopyright} OPEN, \text{\textregistered} CODE INDICATOR
\text{\textcopyright} OPEN, \text{\textregistered} CODE TERMINATOR
\text{\textcopyright} CODE SYMBOL
\text{\textcopyright} OPEN, \text{\textregistered} PREACES
\text{\textcopyright} OPEN, \text{\textregistered} PREACES
\text{\textcopyright} OPEN, \text{\textregistered} SWITZ INDICATOR
\text{\textcopyright} CODE SYMBOL
```
Transcriber's Notes Page. The heading for this "t" page is TRANSCRIBER'S NOTES. The purpose of this page is to identify special formats or usage found throughout a braille volume, and to cite sources. When Nemeth is used in a transcription, the Transcriber's Notes page should include the following note: "Mathematical content is transcribed according to The Nemeth Braille Code for Mathematics and Science Notation, 2022. You can find items that require explanation listed throughout Braille Formats. In addition to those requirements, the Nemeth Code identifies the following as items which require explanation either at the point in the transcription where they appear or on the Transcriber's Notes page:

- Use of capitalized letters in the print copy for digits in nondecimal bases
- Use of alternative forms of Greek letters in the print copy
- Omission of vector arrows which appear in the print copy
- Description of the shapes used in print to depict calculator or computer keys
- When identifiers to displayed expression are moved to the left in the braille edition
- Changing the column format of a formal proof to an itemized list in the braille edition

PRACTICE A

Instructions: Prepare transcriber-generated pages and one contents page according to the guidelines in Section 2 of Braille Formats 2016. Do not use a running head.

Title Page: Use the following information to prepare a title page.

- Book title: ADVENTURES IN Y2K MATHEMATICS
- Book subtitle: Math in the New Millennium
- Authors: Monica and Matías Cruz
- Copyright information: ©2018 by M&M Publishers
- ISBN: 9-6230-99228x
- Transcriber segment: Use your name, your city, and your state
- Volume Information segment: Assume this is the second volume of a three-volume transcription. The braille page designation is "t1-t3, p1, and 1-120" and the print page designation is "v and 87-a123"

Special Symbols Page: A list of UEB symbols to be included on the Special Symbols page can be found in Appendix G of Braille Formats 2016. Follow your agency's decision regarding the "may be included" list, but in Practice A do not include them. List the symbols which appear in the all of the Practices in this lesson, as well as symbols from your title page: acute accent (on the title page); end of proof icon; Nemeth code switch indicators; opening and closing parentheses; typeform indicators for boldface passage, boldface terminator, boldface word, italic passage, italic terminator, italic word, underlined passage, and underlined terminator.
Arrange the symbols in braille order as explained in Section 1.1.2 of *The Rules of Unified English Braille*. To get started with your Special Symbols page, use the model on page F–4 of this lesson.

Transcriber's Notes Page: In addition to the required statement citing the use of the Nemeth Code, write a description of the change made to the column format of the formal proof which appears in Practice E.

Front Matter: Include a transcription of the contents page shown below.

```
ADVENTURES IN Y2K MATHEMATICS  v

CONTENTS

CHAPTER 18  · · · · · · · · · · · · · · · · · · · · · · · · · · 87
  18.1 Roman Numerals
  18.2 Arabic Numerals

CHAPTER 19  · · · · · · · · · · · · · · · · · · · · · · · · · · 95
  19.1 Binary Code
  19.2 Hexadecimal Code

CHAPTER 20  · · · · · · · · · · · · · · · · · · · · · · · · · · 101
  20.1 Exponential Functions
  20.2 Logarithmic Functions

CHAPTER 21  · · · · · · · · · · · · · · · · · · · · · · · · · · 106
  21.1 Inductive Thinking
  21.2 Conjecture
```
Structuring a Textbook, cont.

F5 Body of Text

The entire transcription follows a collaborative pattern between *Braille Formats* and the formats provided for in the Nemeth braille code. When a format is specified in the Nemeth Code, those rules are applied not only to the technical material but also to the UEB material. Some examples are given below.

F5.1 **Follow Nemeth Formatting Rules.** The following matters are governed by Nemeth format and apply both to the technical material and to UEB portions of text.

- Runover margins for itemized material are determined individually for each item. That is, a problem with no subdivisions will be (1-3); the next problem in the same exercise set may have subdivisions and so will be (1-5; 3-5), etc. (Review 6.1.4 in Lesson 6.)
- Instructions preceding itemized material begin in cell 5 and runover in cell 3.
- "Keep together" rules for hyphenated expressions and for abbreviations and a numeral or letter associated with it.
- Mathematical statements—Nemeth rules apply regarding paragraphing, blank lines, and typeface.
- Margins applied to itemized material and their subparagraphs.
- Paragraphs begin in cell 3 and runover in cell 1. (Blocked paragraphing is not allowed.)

F5.2 **Follow Braille Formats Guidelines.** Items which are not addressed in the Nemeth code rely on *Braille Formats* for positioning. Some items governed by *Braille Formats* include:

- Blank lines
- Box lines
- Content and structure of the transcriber-generated pages and front matter
- Displayed literary text
- Exercise questions with answer choices
- Headings
- Indented list format for nontechnical text (e.g., table of contents)
- Lists
- Margins for captions, notes, sidebars, and transcriber's notes
- Page numbering
- Table layout
F5.3 **Context-Dependent Formats**

These formats occur only in Nemeth context.

- Blank lines with spatial arrangements
- Division of mathematical expressions
- Margins for displayed mathematical expressions

In tables, these items follow Nemeth formatting between the switches, and follow *Braille Formats* outside of the switches.

- Omissions in table entries
- Keying
- Tables consisting only of numbers

**Final Word**

Thank you for making the extra effort to learn the Nemeth braille code. We hope you have noticed your transcribing and proofreading skills improve over the course of the lessons. As you take on assignments, check the NFB website periodically for changes to this lesson material and check the BANA website for updates to the braille codes. We also encourage you to take advantage of opportunities to stay informed and connected to other transcribers. The National Braille Association (NBA) publishes a quarterly Bulletin and hosts several learning opportunities—an online forum "Ask An Expert", monthly webinars, and professional development conferences. Local groups offer similar support, for example, the California Transcribers and Educators for the Blind and Visually Impaired (CTEBVI), and the Visual Aid Volunteers of Florida (VAVF).

We wish you success and satisfaction providing much-needed mathematics and science materials for braille readers.

This course concludes with four practices which are characteristic of K-12 grade level topics.
Four Practices

*Instructions:* Use a 40-cell line and a 25-line page. Do not use a running head. Show print and braille page numbers on every page. Use the number shown in the upper right corner as the print page number. A dashed line in print shows where a new print page begins.

Begin numbering with braille page 1, showing the book title at the top of the page as required according to *Braille Formats 2016*.

Begin each Practice on a new braille page, but within each Practice do not force a new braille page unless a rule supports doing so. Do not include the PRACTICE headings in your transcription.

Even though the print page numbers of the Practices are not consecutive, number the braille pages consecutively throughout the four Practices.

If a transcriber's note is required, write it in context—in other words, do not create a Transcriber's Notes page.

Please revisit section F3 of this lesson regarding the editions of UEB and *Braille Formats* used in the transcription of these Practice answers.
PRACTICE B

ADVENTURES IN Y2K MATHEMATICS

ADDING AND SUBTRACTING

\[
\begin{array}{ccccccc}
53 & 14 & 33 & 98 & 2 & 456 \\
+36 & +44 & +21 & +1 & +2 & +13
\end{array}
\]

\[
\begin{array}{ccccccc}
4 & 23 & 71 & 33 & 150 & 9 \\
+84 & +32 & +1 & -22 & -40 & -6
\end{array}
\]

\[
\begin{array}{ccccccc}
826 & 55 & 77 & 420 & 95 & 93 \\
-16 & -2 & -27 & +519 & -62 & +6
\end{array}
\]

ADVENTURES IN Y2K MATHEMATICS

COMPARING FRACTIONS

Directions: Write the correct comparison symbol (> , < , or =) in each box.

1) \( \frac{1}{6} \boxed{\quad} \frac{3}{4} \)
2) \( \frac{1}{2} \boxed{\quad} \frac{3}{6} \)
3) \( \frac{2}{4} \boxed{\quad} \frac{1}{3} \)
4) \( \frac{2}{5} \boxed{\quad} \frac{2}{3} \)
5) \( \frac{9}{10} \boxed{\quad} \frac{4}{5} \)
6) \( \frac{1}{6} \boxed{\quad} \frac{2}{12} \)
Exercise Set 18-6

1. **Home Economics** The cost of using a 60-watt light bulb is given by the function \( y = 0.0036x \). The cost is in dollars, and \( x \) represents the number of hours the bulb is lit.
   a. How much does it cost to use a 60-watt light bulb 8 hours a day for a week?
   b. If the total cost of using a 60-watt bulb is $1.98, for how many hours can it be used?

2. **What's the Question?** The following set of points defines a function: \{(3, 6), (-4, 1), (5, -5), (9, -6), (10, -2), (-2, 10)\}. If the answer is 6, 1, -5, -6, -2, and 10, what is the question?

3. **Physics** Ohm's law can be described by the simple formula \( I = \frac{V}{R} \)

   where \( I \) = current (in amps, A), \( V \) = voltage (in volts, V), and \( R \) = resistance (in ohms, \( \Omega \)). Which equation would you use to solve for voltage?
   a. \( V = I/R \)
   b. \( V = IR \)
   c. \( V = R/I \)

---

**ADDITION, SUBTRACTION, MULTIPLICATION, AND DIVISION OF INTEGERS**

Find the sum, product, or quotient as indicated by the signs +, ×, ÷.

1) \(-6 + -5 = \) \_
2) \(-2 \times -1 = \) \_
3) \(35 \div -5 = \) \_
4) \(5 + -19 = \) \_
5) \(-24 \div 4 = \) \_
6) \(-132 \div -11 = \) \_
7) \(9 \times 9 \times -5 = \) \_
UNIT 6 REVIEW

Fill in the correct answers.

1. If \(7n = 0\), then \(n = \) 
2. Replace the \(\Box\) with a numeral to make a true sentence: \((4 + 8) + \Box = 4 + (8 + 3)\).
3. \(\left(\frac{1}{3} + \frac{5}{6}\right) - \frac{5}{12} = ?\)
4. \(5 \times 5 \times 5 = 5^?\)

Study the equivalencies.

5. To find the mixed-number name for \(\frac{154}{9}\), divide 9 into 154.

\[
\begin{array}{c}
9)154 \\
\underline{9} \\
64 \\
63 \\
1 \\
\end{array}
\]

\(\frac{154}{9} = 17 \frac{1}{7}\)

6. Multiply \(\frac{4}{3}\) by \(\frac{3}{14}\). \(\frac{4}{3} \times \frac{3}{14} = \frac{12+2}{3} = \frac{14}{3}\).

\(\frac{14}{3} \times \frac{3}{14} = 1!\)
Review various topics.

7. If \( R = \{a, b, c, d\} \) and \( S = \{a, c, e, g, h\} \), then the intersection of sets \( R \) and \( S \) is \( \{a, c\} \).

8. Only the following pairs of symbols may occur out of the natural order: I before V or X, X before L or C, C before D or M. For example, \( XL = L - X = 50 - 10 = 40 \).

9. Use the distributive property to multiply 14 by 3.
   \[
   3 \cdot 14 = 3 (10 + 4) \\
   = 3 \cdot 10 + 3 \cdot 4 \\
   = 30 + 12 = 42
   \]

10. "24(five)" is read "two four, base five."

11. A gain of 5 yd followed by a loss of 2 yd gives a total gain of 3 yd. Expressed mathematically, \( (+5) + (-2) = +3 \).

Explain the relationships.

12. \( \overline{AB} \) is congruent to \( \overline{DE} \).

13. \( RS \approx EF; RS \not\approx KL \).

14. \( \overline{DA} \cup \overline{DB} = \overline{AB} \)

15. \[
\frac{7}{\sqrt[2]{6}} \cdot \frac{11}{\sqrt[5]{5}} = \frac{77}{30}
\]

Simplify each radical expression.

16. \( \sqrt[4]{x} \cdot \sqrt{x} \)

17. \( \sqrt[5]{\sqrt[3]{a^2}} \)

18. \( \frac{\sqrt[3]{36x}}{\sqrt[3]{8x^2}} \)
**Theorem** The sum of the angles in a triangle is 180 degrees.

*Given:* \( \triangle ABC \)

*Prove:* \( \angle a + \angle b + \angle c = 180^\circ \)

<table>
<thead>
<tr>
<th>Statement</th>
<th>Reason</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Let ( BD ) be a line through ( B ) parallel to ( AC ).</td>
<td>1. Parallel postulate.</td>
</tr>
<tr>
<td>2. ( \angle a = \angle d ).</td>
<td>2. Corresponding angles are equal.</td>
</tr>
<tr>
<td>3. ( \angle b = \angle b ).</td>
<td>3. Identity.</td>
</tr>
<tr>
<td>4. ( \angle c = \angle e ).</td>
<td>4. Alternate-interior angles are equal.</td>
</tr>
<tr>
<td>5. ( \angle a + \angle b + \angle c = \angle d + \angle b + \angle e ).</td>
<td>5. Sum of equal quantities are equal.</td>
</tr>
<tr>
<td>6. ( \angle d + \angle b + \angle c = 180^\circ ).</td>
<td>6. A straight angle equals 180°.</td>
</tr>
<tr>
<td>7. ( \therefore \angle a + \angle b + \angle c = 180^\circ ).</td>
<td>7. Quantities equal to the same quantity are equal to each other.</td>
</tr>
</tbody>
</table>

Use \( \pi/12 = \pi/3 - \pi/4 \) and the identity for the tangent of a difference to solve \( \tan \left( \frac{\pi}{12} \right) \).

\[
\tan \left( \frac{\pi}{12} \right) = \tan \left( \frac{\pi}{3} - \frac{\pi}{4} \right) = \frac{\tan \frac{\pi}{3} - \tan \frac{\pi}{4}}{1 + \tan \frac{\pi}{3} \tan \frac{\pi}{4}} = \frac{\sqrt{3} - 1}{1 + \sqrt{3} \cdot 1} = \frac{(\sqrt{3} - 1)(\sqrt{3} - 1)}{(\sqrt{3} + 1)(\sqrt{3} - 1)} = \frac{3 - 2\sqrt{3} + 1}{2} = \frac{4 - 2\sqrt{3}}{2} = 2 - \sqrt{3}
\]

The answer is \( \tan \left( \frac{\pi}{12} \right) = 2 - \sqrt{3} \).
ANSWERS TO PRACTICE MATERIAL

Answers observe guidelines in the 2016 edition of *Braille Formats*. See the resource list on page F–3.

PRACTICE A

Title Page
PRACTICE A, cont.

Special Symbols Page

1. US$ 4 Volume
2. DOT LOCATORS PREMES LINK SYMBOLS
3. WINGED 5D PROR ICON
4. BOLDFACE END IDENTIFIER
5. BOLDFACE PASSAGE IDENTIFIER
6. ACUTE ARC ABOVE FOLLOW
7. BOLDFACE TFMATOR
8. CODE END ENEMED CODE IDENTIFIER
9. ENEMED CODE TFMATOR ENEMED
10. CODE SYMBOL
11. BOLD Passage IDENTIFIER
12. BOLD TMATOR
13. SOP 10 PRINTS
14. CLOSE PRINTS
15. BOLD ITALIC END IDENTIFIER
16. BOLD ITALIC PASSAGE IDENTIFIER
17. BOLD ITALIC TFMATOR
18. CLOSE 10 SWITZ IDENTIFIER ENEMED
19. CODE SYMBOL
Transcriber's Notes Page

Mathematical text is transcribed as to:

- Emended URL code: Mathematics &
- Emised Notes in Tilde:

- Initial pro is transcribed as follows:
  - Each number item for Misison column is
  - Placed in xs mate item f v Misision column: xs lrs als v Misision v brg v
  - Misison imply follow s appropriate map number.
Line 1: Instructions for this page say to assume this is the second volume of a transcription. Implied page numbers i-iv are transcribed in Volume 1 only. See Section 2.7.1 of Braille Formats 2016.
ADVENTURES IN NEW MATHEMATICS

ADD & SUBTRACT

53    14    33    98    2    456
+36   +44   +21   +1   +2   +13

4    23    71    33    150    9
+84   +32   +1   -22   -40   -6

826    55    77    420    95    93
-16   -2   -27   +519   -62   +6

Format Comment: The switch indicators do not take the place of required blank lines.
A blank line follows the centered heading; a blank line precedes and follows the spatial material.
Lines 4-5: The embedded comparison symbols need not all fall on the same line because this is not a mathematical "enclosed list".
Lines 5-10: Side-by-side arrangement of nonspatial itemized material is not allowed in the braille transcription. Each identifier starts in cell 1. (Nemeth format rule.)
EXERCISE SET 14-16

1. A 4-inch WATT BULB IS GIVE BY A HVAC SYSTEM. THE BULB IS 9 DOLLARS. THIS REPRESENTS A NUMBER OF HOURS THE BULB IS LIT.

2. WHOM DOES COI TO USE A 4 WATT BULB WHEN 14 HOURS A WEEK?

3. IF THE TOTAL COI IS 4 WATT BULB IS 14 AS YOU LEAVE THE HOUSE, WHAT IS THE TOTAL COI?

Line 1: The heading could be formatted as a cell-5 heading, in which case line 2 would not be blank. (Braille Formats guideline.)

Lines 14-18: Runover margins for itemized material are determined individually for each question. Problem #2 has no subdivisions, so its runovers are in cell 3. (Nemeth format rule.)

Lines 17-18: Alternate transcription: The freestanding numbers without negative signs may be transcribed in UEB, switching to Nemeth only for the three negative numbers.
PRACTICE C, cont.

#C4 ^1, PHYSICS, OHM'S LAW C 2 AE1

DESCRIB$ BY A SIMPLE EQUATION LM

\[ I = \frac{V}{R} \]

\[ I \text{ is } \text{ Current in } \text{ amps} \]

\[ V \text{ is } \text{ Voltage in } \text{ volts} \]

\[ R \text{ is } \text{ Resistance in } \text{ ohms} \]

\[ I = \frac{V}{R} \]

USE TO SOLVE \[ V \]

\[ V = IR \]

\[ V = I \frac{1}{R} \]

\[ V = \frac{1}{R} I \]

-------------------------------------

\[ +, -, \times, \div \]

\[ \text{SUM, PRODUCT, OR QUOTIENT } \]

\[ \text{INDICATED BY } \text{ SIGNS } \]

\[ (1) \quad (2) \quad (3) \quad (4) \quad (5) \quad (6) \]

\[ \text{FIND } \text{ SUM, PRODUCT, OR QUOTIENT } \]

\[ \text{INDICATED } \text{BY } \text{ SIGNS } \]

\[ (1) \quad (2) \quad (3) \quad (4) \quad (5) \quad (6) \]

Line 2: The opening switch is placed at the end of the text on the line before the displayed expression because Nemeth continues on line 4.

Lines 1-11: This problem set starts on a new braille page because question and answer choices should appear on a single page when space permits, regardless of the amount of blank space resulting on the preceding page. [Braille Formats 2016, Section 10.1.7]

Lines 19-25: Side-by-side arrangement of nonspatial itemized material is not allowed in the braille transcription. Each identifier starts in cell 1. (Nemeth format rule.)
UNIT 4 REVIEW

1. Fill in correct answers:
2. 15 divided by 3 = 5
3. Replace $LM = 5 \times 5$ with a numeral to make a true sentence:
4. LM is equal to 15.

STUDY S EQUIVALENCIES:
1. 75 is 25 more than 50.
2. Divide 75 into 25.
3. LM = 25.5. LE.

---

1. 15 divided by 3 = 5
2. Replace $LM = 5 \times 5$ with a numeral to make a true sentence:
3. LM is equal to 15.

STUDY S EQUIVALENCIES:
1. 75 is 25 more than 50.
2. Divide 75 into 25.
3. LM = 25.5. LE.
MULTIPLY \( \frac{2}{3} \) BY A.

\[
\begin{align*}
\text{Review topics:} \\
\text{Only 3 follow pairs of symbols may} \\
\text{our 3 natural order: } & 1 \leq 2 \leq 3 \leq 4 \leq 5 \leq 6 \\
\text{in union or sets of } A \cup B \cup C \\
\text{Example: } & A \cap B \cap C = \emptyset \\
\text{Use distributive property to} \\
\text{multiply } \frac{1}{3} \text{ by } \frac{2}{3} \\
\text{Example:} \\
\text{Pairs:} \\
& (1, 2), (3, 4), (5, 6) \\
& (7, 8), (9, 10) \\
& (11, 12), (13, 14) \\
& (15, 16), (17, 18) \\
& (19, 20), (21, 22) \\
& (23, 24), (25, 26) \\
\text{Example: } & A \cap B \cap C = \emptyset \\
\text{Base five:} \\&
PRACTICE D, cont.

1. Loss of 4 yards gives a total gain of 
2. If you express mathematically, 
3. \((^+)(^-)(^+)\) 
4. Explain the relationships. 
5. LM = if all beg. LE is greater to 
6. LM = if all beg. 
7. LM = if all beg. LE = all beg. 
8. LM = if all beg. 
9. LM = if all beg. LE = all beg. 
10. LM = if all beg. LE = all beg. 
11. LM = if all beg. LE = all beg. 
12. LM = if all beg. LE = all beg. 
13. LM = if all beg. LE = all beg. 
14. LM = if all beg. LE = all beg. 
15. LM = if all beg. LE = all beg. 
16. LM = if all beg. LE = all beg. 
17. LM = if all beg. LE = all beg. 
18. LM = if all beg. LE = all beg. 
19. LM = if all beg. LE = all beg. 
20. LM = if all beg. LE = all beg. 
21. LM = if all beg. LE = all beg. 
22. LM = if all beg. LE = all beg. 
23. LM = if all beg. LE = all beg. 
24. LM = if all beg. LE = all beg. 
25. LM = if all beg. LE = all beg.
Lines 1-8: Your transcriber's note may say anything similar, describing the change in format of the two-column proof.
Line 9: The line before the mathematical statement (THEOREM) is blank.
Line 10: The line following the end of the proof is blank. (See Section 8.3.2 of Braille Formats regarding the blank line after a list when a page change indicator follows.)
Line 15: The displayed expression begins in cell 3 with runovers in cell 5.
Lines 16-23: Because one of the links requires division, each link begins on a new line. (Nemeth format rule.)
Line 18: The divided link begins with the main fraction line, and is not indented further because, in print, the signs of comparison are not vertically aligned.