

Nemeth Code Symbols Used in the Middle Grades and Strategies for Supporting Math Learning

Lesson 2: Nemeth Code Symbols Used in the Middle Grades, Part 2



Objectives

Participants will be able to:

- Read and write problems containing
 1. absolute values
 2. inequality signs (less than or equal to, greater than or equal to, and not equal to)
 3. the Greek letter pi (lowercase) π
 4. the approximately equal to sign
 5. superscripts
 6. subscripts without indicators
 7. square roots
- Read and write math word problems that require use of the opening Nemeth Code indicator, the Nemeth Code terminator, and the single-word switch indicator.

Nemeth Code Switch Indicators

⠠⠠⠠ Opening Nemeth Code indicator

⠠⠠⠠ Nemeth Code terminator

⠠⠠⠠ Single-word switch indicator

- The opening Nemeth Code indicator can be placed at the end of a line of literary text **or** on its own line.
- The Nemeth code terminator can also be placed after the math it ends **or** on its own line.
- When using the single-word switch indicator, write the single word in contracted braille (UEB).
- When deciding where to place indicators, consider consistency and clarity for the braille reader.
- Keep all mathematical content on the same line whenever possible.

Absolute Value (2 vertical bars)

⠠⠨⠠ absolute value | |

A number enclosed in vertical bars does not need a numeric indicator.

⠠⠨⠠⠨⠠ | - 5 | absolute value of negative 5

⠠⠨⠠⠨⠠ - | - 2 | negative absolute value of negative 2

$$|-14| - 7 = \underline{\hspace{2cm}}$$

⠠⠨⠠⠨⠠⠨⠠ ⠠⠨⠠⠨⠠ ⠠⠨⠠⠨⠠

24. Is $-|-8|$ positive?




⠠⠨⠠⠨⠠⠨⠠ ⠠⠨⠠⠨⠠ ⠠⠨⠠⠨⠠ ⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠⠨⠠

Inequality Signs









 ≤ less than or equal to

 ≥ greater than or equal to

 ≠ not equal to

$4 \leq x$   

$2y \geq 4x - 8$       

$32 \neq -|-32|$        

The Greek Letter pi (lowercase) π

⋮⋮ π Greek letter pi (lowercase)

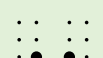
- The Greek letter indicator ⋮ identifies a letter as being from the Greek alphabet.
- Greek letters are often used in math and science.
- “Pi” is the first Greek letter students learn.
- Even though the lowercase form of π in Nemeth Code is identical to the lowercase form in UEB, you must switch to Nemeth Code when π appears in Nemeth within UEB Contexts.









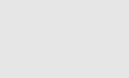
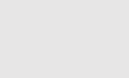
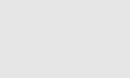
Approximately Equal To











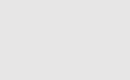
 \approx approximately equal to


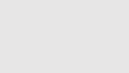
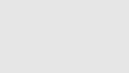
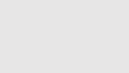
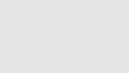
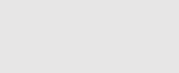
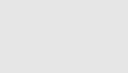
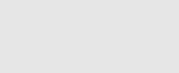
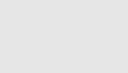
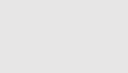
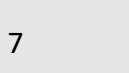
- Two numbers are approximately equal to each other when they are almost equal to each other – very close for all practical purposes, but not exactly equal.
- In print the symbol looks like a wavy equals sign or two tilde signs – one on top of the other, which is why the Nemeth version is two tilde signs written together with no spacing between the two symbols.

2. If $\pi \approx 3.14$ and $C = 2\pi r$, then $C \approx 6.28r$.

Single-word switch indicator 

Activity 2A

Interline the following.

⠠⠋⠠⠇⠠⠅⠠⠍⠠⠇⠠⠅⠠⠇⠠⠍⠠⠇⠠⠅

⠠⠋⠠⠇⠠⠅⠠⠍⠠⠇⠠⠅⠠⠇⠠⠍⠠⠇⠠⠅⠠⠇⠠⠍⠠⠇⠠⠅⠠⠇⠠⠍⠠⠇⠠⠅⠠⠇⠠⠍⠠⠇⠠⠅⠠⠇⠠⠍⠠⠇⠠⠅

⠠⠋⠠⠇⠠⠅⠠⠍⠠⠇⠠⠅⠠⠇⠠⠍⠠⠇⠠⠅⠠⠇⠠⠍⠠⠇⠠⠅⠠⠇⠠⠍⠠⠇⠠⠅⠠⠇⠠⠍⠠⠇⠠⠅⠠⠇⠠⠍⠠⠇⠠⠅⠠⠇⠠⠍⠠⠇⠠⠅

Activity 2B

Braille the following problems.

1. $y \geq -4$

2. $|5 - 8| \neq -|8 - 5|$

3. $2y \leq x + 4$

4. $\frac{2}{3} \approx .666$

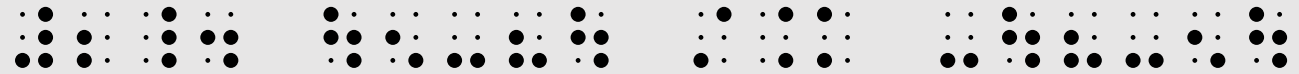
5. $|5 - 9| + 3 = \underline{\hspace{2cm}}$

Activity 2B: Answer Key

1. $y \geq -4$



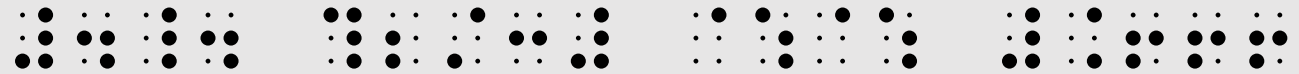
2. $|5 - 8| \neq -|8 - 5|$



3. $2y \leq x + 4$



4. $\frac{2}{3} \approx .666$



5. $|5 - 9| + 3 = \underline{\hspace{2cm}}$



Superscript

- ⠠ superscript indicator (dots 4-5)
- ⠠ baseline indicator (dot 5)
- A baseline indicator is needed if a superscript **is not** followed by a space.
- No baseline indicator is needed if a space follows a superscript.

y^2 ⠠⠠⠠⠠⠠

$4^3 = 64$ ⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

$3^2 - 8$ ⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

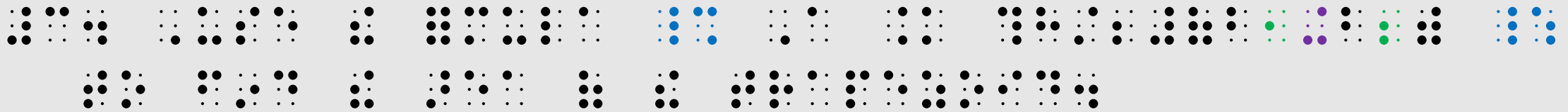
$(5^2 - 6^3)$ ⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠⠠

Subscripts Without Indicators

- A variable with a numeric subscript does not use a subscript indicator.
- No baseline indicator is needed if no subscript indicator is used.

(x_1, y_1)

3. Use the formula $A = \frac{h}{2}(b_1 + b_2)$ to find the area of the trapezoid.



Square Roots

•• radical symbol

•• termination symbol

$\sqrt{81}$ ••••• the square root of 81

$\sqrt{\frac{1}{16}}$ •••••••• the square root of one-sixteenth

$\sqrt{0.36}$ •••••• the square root of zero point three six

Square Roots continued

- Say “end root” to tell the braille reader when radicand ends.
- Use a baseline indicator within a radicand as needed, for example to end a square root (example 1).

$\sqrt{y^3}$



the square root of y cubed end root

\sqrt{y}^3



the square root of y end root cubed

Activity 2C

Braille the problems.

$$(1) \ y^3 = 2^3$$

$$(2) \ 2(7^2 + 5^3) = ?$$

$$(3) \ (x_2, y_2)$$

$$(4) \ \sqrt{100}$$

$$(5) \ \sqrt{x^8}$$

Activity 2C: Answer Key

(1) $y^3 = 2^3$



(2) $2(7^2 + 5^3) = ?$



(3) (x_2, y_2)



(4) $\sqrt{100}$



(5) $\sqrt{x^8}$



Activity 2D

Braille the following.

1. Is $-|-54|$ a negative number?

2. $\pi \approx 3.14$ or $\frac{22}{7}$.

3. To find the area of a trapezoid with bases b_1 and b_2 , use the formula $A = \frac{h}{2}(b_1 + b_2)$.

Activity 2D: Answer Key

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 27 28 29 30 31 32 33 34 35 36

37 38 39 40 41 42 43 44

45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

101 102 103 104 105

106 107 108 109 110 111 112 113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144 145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200

201 202 203 204 205 206 207 208 209 210 211 212 213 214 215 216 217 218 219 220 221 222 223 224 225 226 227 228 229 230 231 232 233 234 235 236 237 238 239 240 241 242 243 244 245 246 247 248 249 250 251 252 253 254 255 256 257 258 259 260 261 262 263 264 265 266 267 268 269 270 271 272 273 274 275 276 277 278 279 280 281 282 283 284 285 286 287 288 289 290 291 292 293 294 295 296 297 298 299 300

301 302 303 304 305 306 307 308 309 310 311 312 313 314 315 316 317 318 319 320 321 322 323 324 325 326 327 328 329 330 331 332 333 334 335 336 337 338 339 340 341 342 343 344 345 346 347 348 349 350 351 352 353 354 355 356 357 358 359 360 361 362 363 364 365 366 367 368 369 370 371 372 373 374 375 376 377 378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400