



Teaching and Learning of the Nemeth Braille Code

- **Superscripts**
- **Subscripts**



Definition of Terms

3 Level Indicators

- The normal level of writing is called the “base line”

dot 5 ∴

- Superscript – above baseline, raised

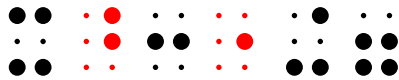
dot 4-5 ∴

- Subscript – below baseline, lowered

dot 5-6 ∴

Examples

■ $x^3 + 7$



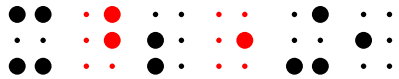
■ y_f



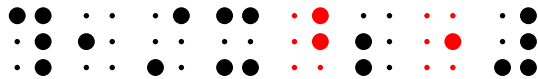
■ x^{-5}



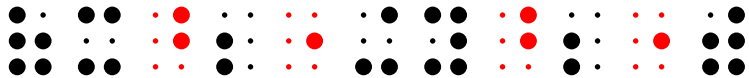
■ $x^2 + 1$



■ $\frac{1}{x^2}$



■ $(x^2 + y^2)$



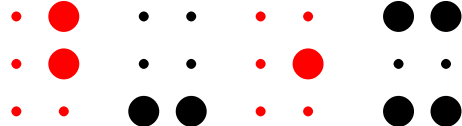


Left Superscripts and Subscripts

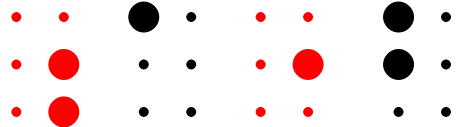
- Use level indicator first, then subscript or superscript symbol, then base line indicator, and finally the symbol on the baseline.
- Not used very often.

Examples

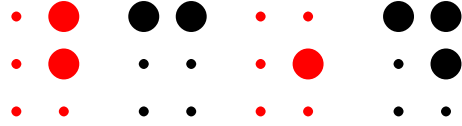
■ $\neg X$



■ a^b



■ c^d

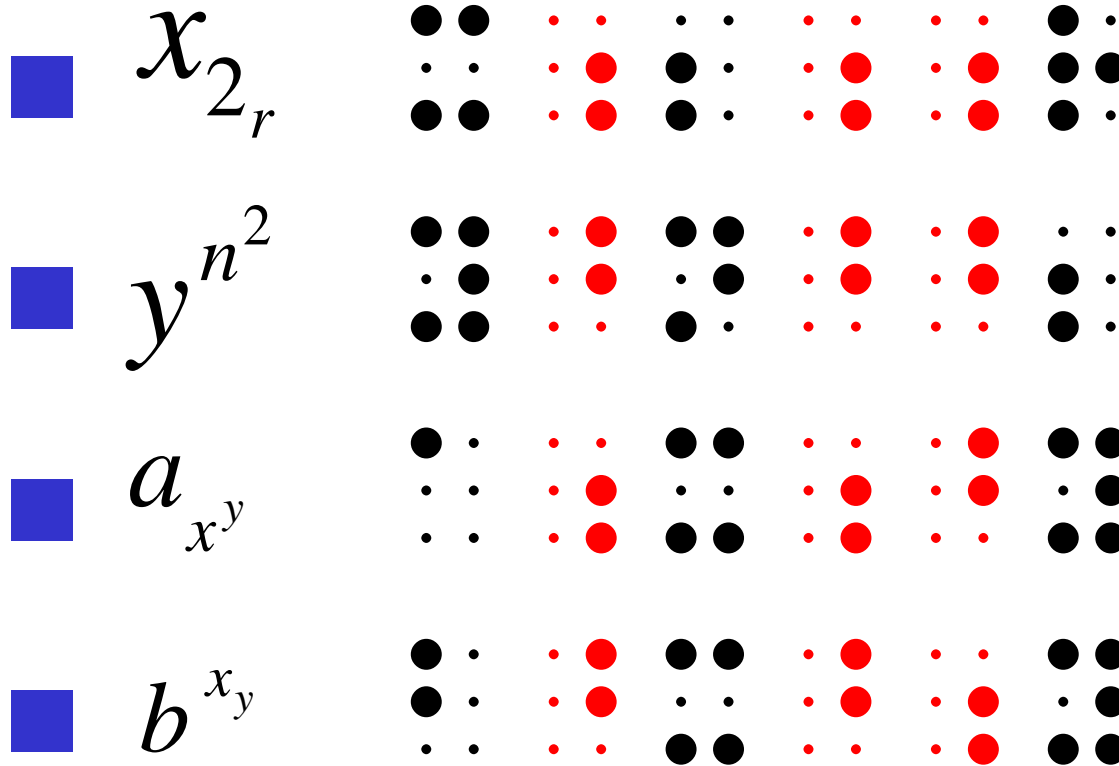




Hierarchy of Superscripts and Subscripts

- First Order – one level from base line
- Second Order – two levels from base line
- Etc.

Examples





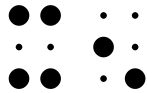
Numeric Subscripts

- Do not use a subscript indicator if the subscript
 - Is Numeric
 - Is First Order
 - Is associated with an abbreviated function name or a letter which has a separate identity
 - Doesn't have its own subscript or superscript
- Note: A prime (') is not considered a superscript

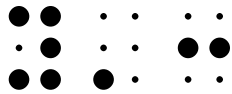


Examples

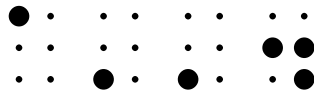
- X_5



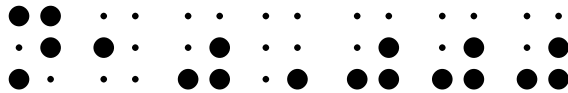
- y'_3



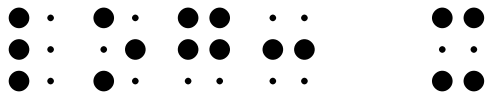
- a''_4



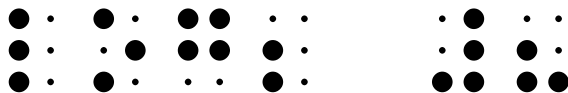
- $n_{10,000}$



- $\log_3 X$



- $\log_2 8$



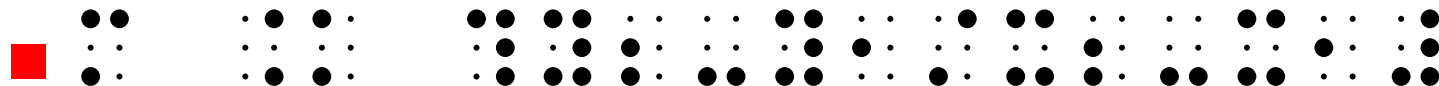
Numeric Subscripts and the Base Line Indicator

- The baseline indicator is not needed after a numeric subscript

- $(x_2 - x_1)^2 + (y_2 - y_1)^2$

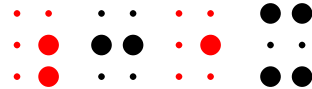


- $m = \frac{y_2 - y_1}{x_2 - x_1}$

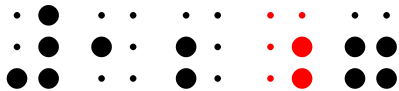


Why Do These Need Subscript Indicators?

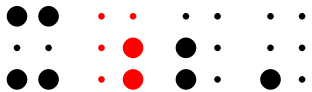
■ ${}_3X$



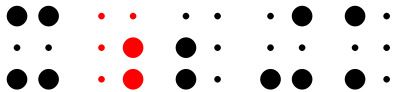
■ 12_7



■ $X_{2'}$



■ X_{2+k}



■ seven_3

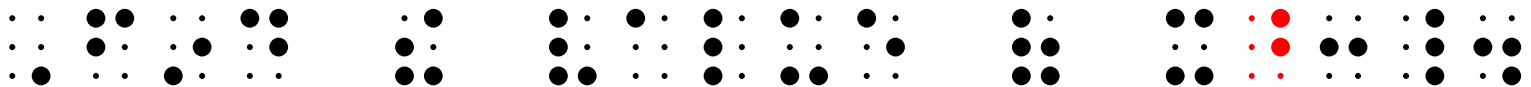


Changes of Level

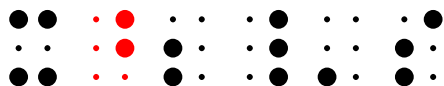
#1

- No base line indicator is needed if the PI follows the superscript or subscript

- Find the value of x^3 .

-  Braille representation of the expression x^3 . It consists of a square Braille cell for 'x' followed by a superscript indicator (two dots in the top-left and bottom-left positions) and a square Braille cell for '3'. The superscript indicator and the '3' cell are both highlighted in red.

- x^2 's

-  Braille representation of the expression x^2 's. It consists of a square Braille cell for 'x' followed by a superscript indicator (two dots in the top-left and bottom-left positions) and a square Braille cell for '2'. The superscript indicator and the '2' cell are both highlighted in red.

Changes of Level

#3

No base line indicator is needed if a space or transition to a new line comes after the superscript or subscript and is followed by literary text, unrelated mathematical material, or a comparison symbol

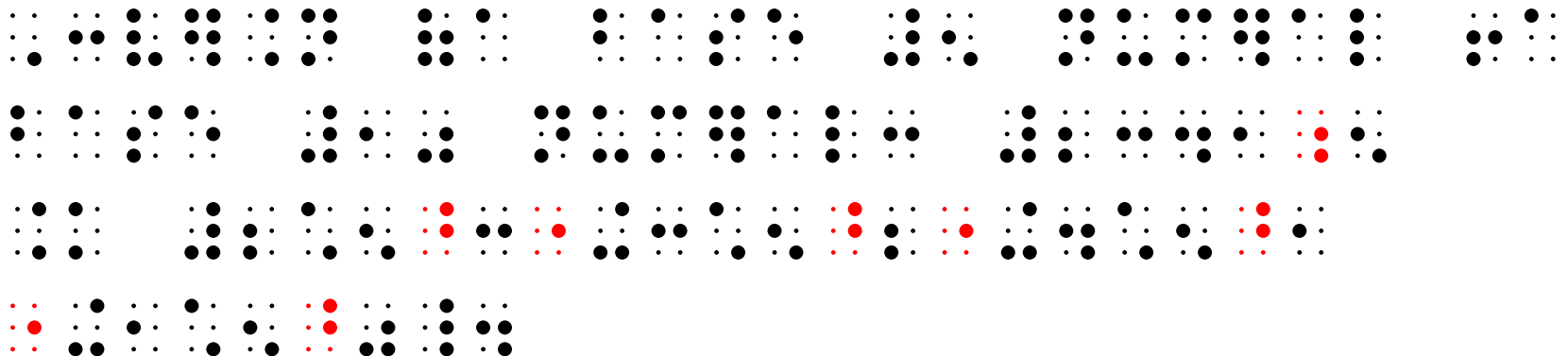
■ $2p^2$ is always even.



■ $2^x < 3^x$



■ Conversion of a base 5 numeral to a base 10 numeral: $2341_5 = 2 \cdot 5^3 + 3 \cdot 5^2 + 4 \cdot 5^1 + 1 \cdot 5^0$





Changes of Level

#5

- Contractions may not be used in a word or abbreviation in contact with a level indicator.

- 13_{seven}

- ⠠1 ⠠3 ⠠seven

- inch-pound²

- ⠠inch ⠠pound ⠠sup2



Assignment

■ p. 74 all