

## Five-Step Rule and Exceptions Lesson 2

### Single-Digit Repeating Decimal Number

## Important Note

For all braille examples, emboss the “L2-Five-Step-Problems-Only.brf” file as a supplement to this lesson.

## Background

The Five-Step Rule is used to modify or change a math expression. When we modify just a single digit or letter, we don't use this rule. For these expressions, there is a contracted form that makes them easier and quicker to read.

When writing decimals, there may be a horizontal bar over some of the digits in print. If a bar is over a single digit in a decimal number, you do not use the Five-Step Rule, but if it is over more than one digit, you do. In this lesson we will only focus on a single digit or letter with a bar over it.






## Basic Rules

When a horizontal bar is used over a single digit or letter in print, write the horizontal bar symbol (dots 1-5-6) immediately after the digit or letter in braille. We most often see this notation when writing single-digit repeating decimals, where the bar over the single digit indicates that it repeats forever.

## Examples







1. The following steps outline how to write zero point three with the 3 repeating:

 $0.\overline{3}$







- Numeric indicator (dots 3-4-5-6) 
  - Zero (dots 3-5-6) 
  - Decimal point (dots 4-6) 
  - Three (dots 2-5) 
  - Horizontal Bar (dots 1-5-6) 
2. The following steps outline how to write two point five four with the 4 repeating:

$$2.5\overline{4}$$

Figure 1 shows a 3x3 grid of 3x3 dot patterns. Each pattern is a 3x3 grid of dots, some of which are filled (black) and some are empty (white). The patterns represent different states of a 3x3 grid.

- Numeric indicator (dots 3-4-5-6) 
  - Two (dots 2-3) 
  - Decimal point (dots 4-6) 
  - Five (dots 2-6) 
  - Four (dots 2-5-6) 
  - Horizontal bar (dots 1-5-6) 
3. The following steps outline how to write point nine one six with the 6 repeating:

$$.9\overline{16}$$

- a. Numeric indicator (dots 3-4-5-6) 
- b. Decimal point (dots 4-6) 
- c. Nine (dots 2-6) 
- d. One (dots 2-6) 
- e. Six (dots 2-5-6) 
- f. Horizontal bar (dots 1-5-6) 

4. Sometimes, a horizontal bar is used above a single letter in print. For example,  $\bar{x}$  is written as an x with a horizontal bar over it. It is used to refer to the mean (or average) of a set of values when studying statistics. The following steps outline how to write  $\bar{x}$ :

 $\bar{x}$ 

- a. x (dots 1-3-4-6)    ::
- b. Horizontal bar (dots 1-5-6)    ::

## Activity Time

Write the expressions from Examples 1 to 4:

1. zero point three with the 3 repeating
2. two point five four with the 4 repeating
3. point nine one six with the 6 repeating
4.  $\bar{x}$