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# Transforming Simple Repeating Decimals to Fractions and Vice Versa



- 1 Convert the fraction  $\frac{1}{3}$  into a decimal by using long division.
  - 2 Define a repeating decimal.
  - 3 Decide how much money each band member should receive.
  - 4 Write repeating decimals as fractions.
  - 5 Determine the repeating decimal equivalent for each given fraction and vice versa.
- + with lots of tips, answer keys, and detailed answer explanations for all of the problems.



The complete package, including all problems, hints, answers, and detailed answer explanations is available for all [sofatutor.com](https://www.sofatutor.com) subscribers.



## Convert the fraction $\frac{1}{3}$ into a decimal by using long division.

Fill in the blanks.

$$\begin{array}{r} 0.33 \\ 3 \overline{)1.00} = 0.\bar{3} \\ \underline{-9} \\ 10 \\ \underline{-9} \\ 1 \end{array}$$

- sum   zero   decimal point   repeating   divisor   multiplied   result  
factor   division bar   2   dividend   divided   1   terminating  
remainder

1 The .....<sup>1</sup>, 3, doesn't go into into the .....<sup>2</sup>, 1. So we put 0 above the .....<sup>3</sup>, as well as a decimal point.

Now we can put a 0 behind the dividend, 1, and divide 10 by 3. We place the whole number, 3, above the bar, and ignore the .....<sup>4</sup>, 1, for a bit.

2 The answer from this operation is multiplied by the divisor:  $3 \times 3 = 9$ . We place the .....<sup>5</sup> below the number that has been divided.

Now we subtract the bottom number from number at the top:  $10 - 9 = 1$ .

3 Next we put a .....<sup>6</sup> behind the remainder, 1, and proceed as before: 10 .....<sup>7</sup> by 3 is also 3 with a remainder of 1.

We follow the same steps as above.



4

If we continue, we will always get .....<sup>8</sup> as a remainder. Therefore the result is

$$1 \div 3 = 0.33333.....$$

It is a .....<sup>9</sup> decimal, and you can show this by using a horizontal line:  $1 \div 3 = 0.\overline{3}$ .



## Hints for solving these problems

1  
of 5

**Convert the fraction  $\frac{1}{3}$  into a decimal by using long division.**

### Hint #1

You have to do the same steps over and over again.

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### Hint #2

To show that a decimal is a repeating decimal, place a horizontal line over the repeating numbers.

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## Answers and detailed answer explanations for these problems

1  
of 5

**Convert the fraction  $\frac{1}{3}$  into a decimal by using long division.**

**Answer key:** 1: divisor // 2: dividend // 3: division bar // 4: remainder // 5: result // 6: zero // 7: divided // 8: 1 // 9: repeating

$$\begin{array}{r} 0.33 \\ 3 \overline{)1.00} = 0.\overline{3} \\ \underline{-9} \\ 10 \\ \underline{-9} \\ 1 \end{array}$$

You already know that a fraction bar indicates a division.

So we can say that  $\frac{1}{3} = 1 \div 3$ .

But how can you divide 1 by 3? On the right, you can see the problem worked out.

If we use long division, we will always have a remainder of 1. We can repeat this process over and over and OVER again.

$$1 \div 3 = 0.33333\text{.....}$$

We call this a repeating decimal and indicate the repeating portion by placing a horizontal line over the numbers:

- $0.\overline{3}$
- $0.\overline{623}$
- $0.\overline{1025}$

...and so on.