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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 subscribers.

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

Fill in the blanks.

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

| sum | zero | decimal point | repeating | divisor | multiplied | result |

| factor | division bar | 2 | dividend | divided | 1 | terminating |

| remainder |

1   The ＿＿＿＿＿＿＿＿$_1$, 3, doesn't go into into the ＿＿＿＿＿＿＿$_2$, 1. So we put 0 above the ＿＿＿＿＿＿＿$_3$, 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 ＿＿＿＿＿＿＿$_4$, 1, for a bit.

2   The answer from this operation is multiplied by the divisor: $3 \times 3 = 9$. We place the ＿＿＿＿＿＿＿$_5$ 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 ＿＿＿＿＿＿＿$_6$ behind the remainder, 1, and proceed as before: 10 ＿＿＿＿＿＿＿$_7$ by 3 is also 3 with a remainder of 1.

We follow the same steps as above.

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4 If we continue, we will always get _____ $_8$ as a remainder. Therefore the result is

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

It is a _____ $_9$ decimal, and you can show this by using a horizontal line: $1 \div 3 = 0.\overline{3}$.

Hints for solving these problems

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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.

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

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

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

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

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.

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.