Writing Repeating Decimals as Fractions

In a previous tutorial, we explored solution paths for writing decimals as fractions.

In this tutorial, we'll explore solution paths for writing repeating decimals as fractions.

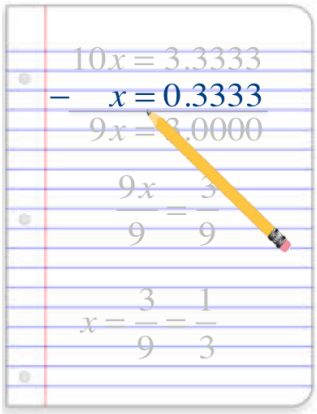
A student wrote the repeating decimal 0.333… as the fraction ⅓. Let's consider their solution path.

$$10x = 3.3333$$
$$-\quad x = 0.3333$$
$$9x = 3.0000$$

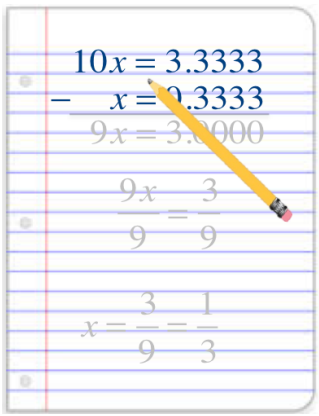
$$\frac{9x}{9} = \frac{3}{9}$$

$$x = \frac{3}{9} = \frac{1}{3}$$

- How would I explain why the student begins their solution path by writing $x = 0.3333$?



- Why is the student now writing $10x = 3.3333$? How would I explain my thinking in performing this step?



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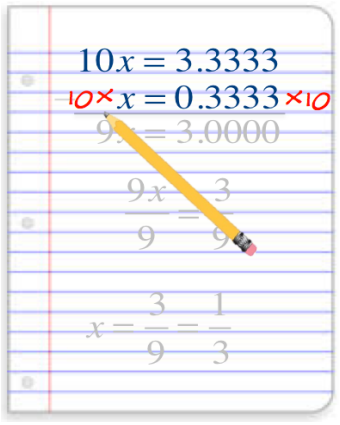
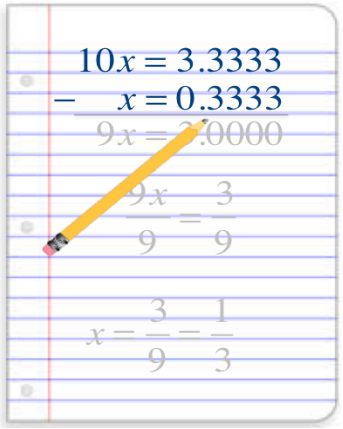
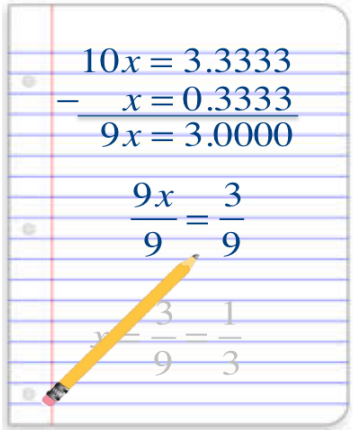
- How would I determine the power of 10 required in performing this multiplication step?



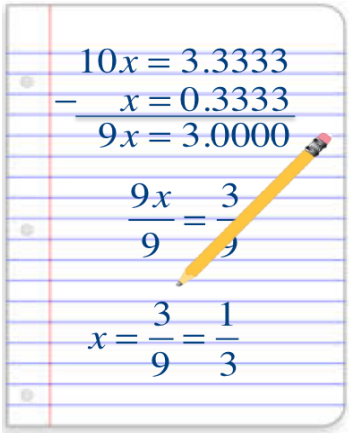
- What am I trying to accomplish by writing the two equations?



- How would I explain the math being performed at this step?



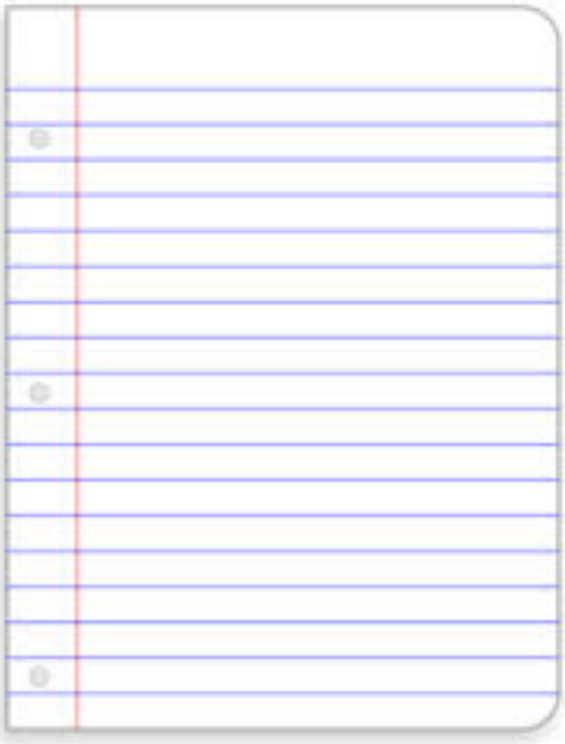
- How would I explain the calculation being performed in this final step of the solution path?



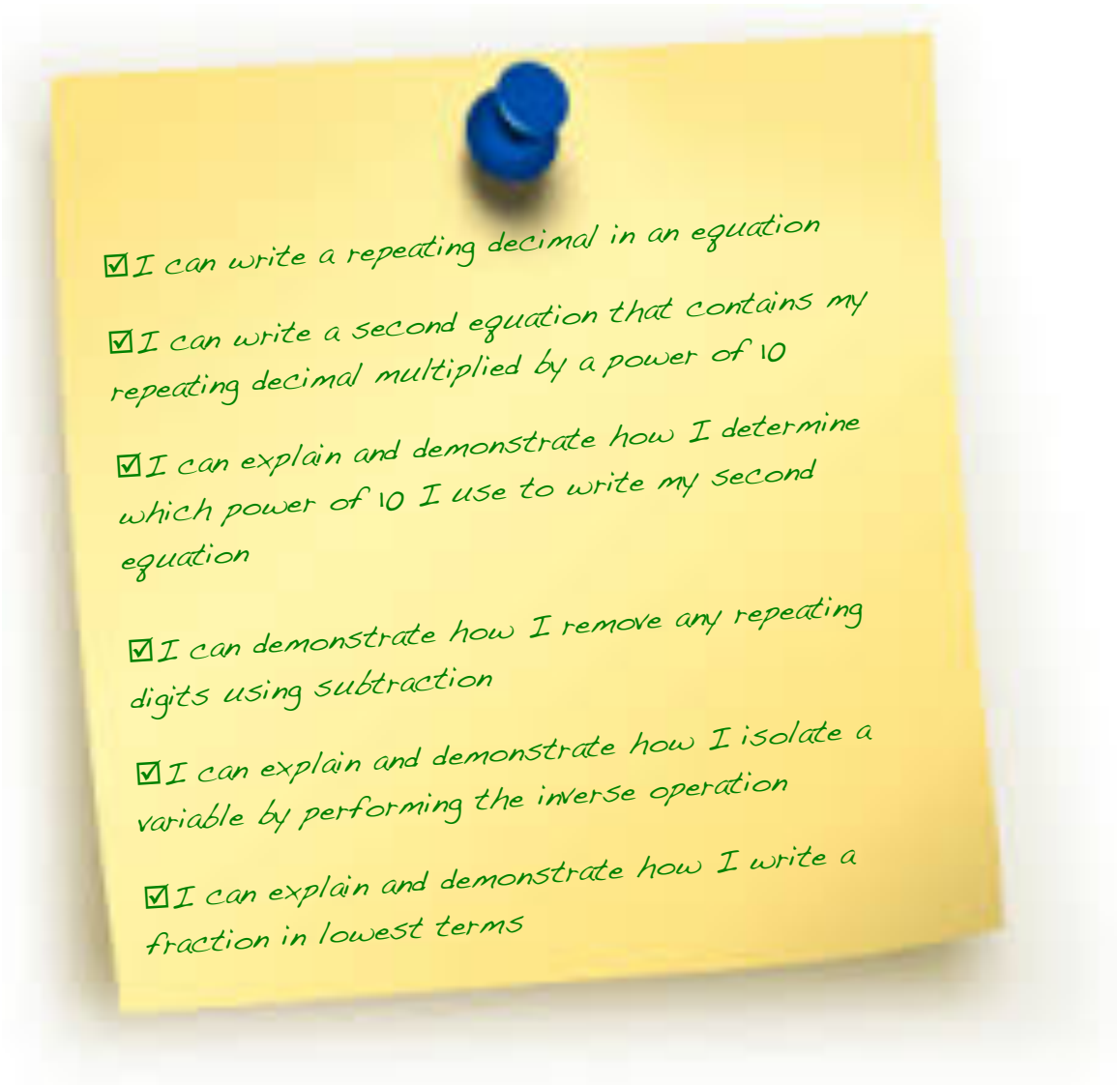
- How would I explain and demonstrate writing a fraction in lowest terms?

Let's review this solution approach using another example.

Write the repeating decimal 0.090909... as a fraction in simplest form or lowest terms.



Writing Repeating Decimals as Fractions–Skills Checklist



- ☑ I can write a repeating decimal in an equation
- ☑ I can write a second equation that contains my repeating decimal multiplied by a power of 10
- ☑ I can explain and demonstrate how I determine which power of 10 I use to write my second equation
- ☑ I can demonstrate how I remove any repeating digits using subtraction
- ☑ I can explain and demonstrate how I isolate a variable by performing the inverse operation
- ☑ I can explain and demonstrate how I write a fraction in lowest terms

Writing Repeating Decimals as Fractions-Worksheet