*A recurring decimal is a decimal with a digit, or group of digits, that repeats forever.*

*For example, $\frac{1}{3} = 1 \div 3 = 0.333333...$ with the 3s repeating forever.*

*We can write this as $0.\dot{3}$.*

Imagine I started with the number $x = 0.\dot{2}$

How could you write $2.\dot{2}$ in terms of $x$?

Can you find two different ways?

**Can you create an equation, and then solve it to express $x$ as a fraction?**

Now let's consider $y = 0.25252525...$, where the digits 2 and 5 keep alternating forever.

*This can be written as $0.\dot{2}\dot{5}$, with dots over the first and last digit in the repeating pattern.*

How could you write $25.\dot{2}\dot{5}$ in terms of $y$, in two different ways?

**Can you create an equation, and then solve it to express $y$ as a fraction?**

Now try writing the following recurring decimals as fractions:

- $0.\dot{4}0\dot{5}$
- $0.8\dot{3}$
- $0.002\dot{7}$

**Can you describe a method that will allow you to express *any* recurring decimal as a fraction?**