Recurring decimals

Here's a typical question.

Convert 0.234234234234...to a fraction

Here's how to do it.

1. Find the length of the repeating sequence. This number is 'n' and tells you the power of 10 you're going to need in the next step
2. Multiply the decimal by 10^n
3. Now take the original number from the new one and divide to find the fraction

Example

Convert r= 0.234234234234...to a fraction

The repeating sequence here is 3 digits long (234) so the length of the repeating sequence is 3.

Multiply r by 10^3 giving 1000r = 234.234234234….

Now do the subtraction 1000r - r

$$\begin{aligned} 1000r &= 234.234234234 \\ r &= 0.234234234 \\ 999r &= 243.000000000 \end{aligned}$$

So we have 999r = 243 so r = 243/999

In this case we can simplify the fraction, and you should always see if this is possible, so the final answer is

<u>0.243243243…. = 26/111</u>

Why not try a few?

4. 0.124124124…
5. 0.44444…
6. 0.343434…
7. 0.145614561456…
8. 0.123123123..
9. 0.336336336…

Answers on the next page - don't cheat!!

Answers

1. 124/999
2. 4/9
3. 34/99
4. 1456/9999
5. 123/999 = 41/333
6. 336/999 = 112/333