Recurring Decimals to Fractions

Year 11 · Number · y11-recurring-decimals

Name: _____ Date: _____

Class: _____ Score: _____ / _____

Instructions
Answer every question in Practice. Try the Challenge section once Practice is complete. 10 questions in total.

Practice

1. Write 0.4 recurring (0.4444...) as a fraction in its simplest form.

2. Write 0.7 recurring (0.7777...) as a fraction.

3. Prove that 0.3 recurring = $\frac{1}{3}$ using algebra: let x = 0.3333..., then 10x = 3.333..., so 10x - x = 3.

Solve for x.

4. Write 0.27 recurring (0.272727...) as a fraction in its simplest form.

5. For a single repeating digit, multiply by 10; for a two-digit repeating block, multiply by 100 -- the multiplier must match the block length. Write 0.5 recurring (0.5555...) as a fraction.

6. Let x = 0.181818... (repeating block '18', so multiply by 100): 100x = 18.1818..., then 100x - x = 18, so 99x = 18. Solve for x as a fraction in simplest form.

7. Step 1: x = 0.6666... Step 2: 10x = 6.6666... Step 3: 10x - x = 6.666... - 0.666... = 6, so 9x = 6. Solve for x as a fraction in simplest form.

8. For 0.454545..., the repeating block is '45' (2 digits), so use x = 0.454545... and 100x = 45.454545... Subtract to get 99x = 45. Solve for x as a fraction in simplest form.

Challenge

1. Write 0.58333... (only the 3 recurs) as a fraction in its simplest form.

2. Write 0.8666... (only the 6 recurs) as a fraction in its simplest form.

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