LESSON MAKER PRO

Repeats Become Fractions

Turn repeating decimals into exact fractions.

GRADE 7 · 7A.NS.B.10.b

7A.NS.B.10.b "Convert a decimal expansion that repeats in a pattern into a rational number."

NAME _____ DATE _____

LINE UP AND SUBTRACT

Let x equal the repeating decimal. Multiply by powers of 10 until the repeating digits line up, then subtract to cancel the endless tails. Solve for x and simplify the fraction.

WORKED EXAMPLE

Write 0.363636... as a fraction in simplest form.

1. Let x = 0.363636...
2. Multiply by 100: 100x = 36.363636...
3. Subtract: 100x - x = 36, so 99x = 36.
4. Divide and simplify: x = 36/99 = 4/11.

Answer: 4/11

PRACTICE 6 problems

1 Write 0.888... as a fraction in simplest form.

ANSWER _____

2 Write 0.272727... as a fraction in simplest form.

ANSWER _____

3 Write 0.555... as a fraction in simplest form.

ANSWER _____

4 Write 0.090909... as a fraction in simplest form.

ANSWER _____

5 Write 0.23333... as a fraction in simplest form.

ANSWER _____

6 Write 1.454545... as a fraction in simplest form.

ANSWER _____

APPLY IT Show your work

1 In a video game, a shield covers exactly 0.252525... of a player's health bar. What fraction of the health bar does the shield cover?

WORK SPACE

ANSWER _____

2 A video editor changes a clip's length to exactly 1.1666... times its original length. Write this length factor as a fraction in simplest form.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A game's boost factor is exactly 0.123123123.... Write it as a fraction in simplest form. Show how subtraction cancels the repeating digits.

WORK SPACE AND ANSWER

ANSWER KEY

Repeats Become Fractions

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Write 0.888... as a fraction in simplest form.	**8/9**
2	Write 0.272727... as a fraction in simplest form.	**3/11**
3	Write 0.555... as a fraction in simplest form.	**5/9**
4	Write 0.090909... as a fraction in simplest form.	**1/11**
5	Write 0.23333... as a fraction in simplest form.	**7/30**
6	Write 1.454545... as a fraction in simplest form.	**16/11**

PART 2 · APPLY IT

1. **25/99** Let x = 0.252525.... Then 100x - x = 25, so x = 25/99.
2. **7/6** Let x = 1.1666.... Then 10x - x = 10.5, so 9x = 10.5 and x = 7/6.

CHALLENGE

Let x = 0.123123123.... Then 1000x = 123.123123123.... Subtract: 1000x - x = 123, so 999x = 123 and x = 123/999 = 41/333.

Accept equivalent fractions if the method is correct, but ask students to simplify when the problem says to do so. The trailing dots mean the shown digit pattern continues forever.