LESSON MAKER PRO

Decimals That Repeat

Turn repeating decimals into fractions.

GRADE 8 · 8.NS.1b

8.NS.1b "Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually..."

NAME _____ DATE _____

MAKE THE REPEATS MATCH

A rational number can have a decimal that ends or repeats. To turn a repeating decimal into a fraction, call it x, then multiply by powers of 10 until the repeating parts line up. Subtract to remove those parts, then solve for x.

WORKED EXAMPLE

Write 0.454545... as a fraction in simplest form.

1. Let x = 0.454545...
2. Multiply by 100: 100x = 45.454545...
3. Subtract x: 99x = 45.
4. Divide: x = 45/99 = 5/11.

Answer: 5/11

PRACTICE 6 problems

1 Write 0.777... as a fraction in simplest form.

ANSWER _____

2 Write 0.121212... as a fraction in simplest form.

ANSWER _____

3 Write 0.1666... as a fraction in simplest form.

ANSWER _____

4 Write 2.666... as a fraction in simplest form.

ANSWER _____

5 Write 0.2333... as a fraction in simplest form.

ANSWER _____

6 Write 0.08333... as a fraction in simplest form.

ANSWER _____

APPLY IT Show your work

1 A music app shows a preview's length as 0.363636... minutes. Write this time as a fraction of a minute. How long do 22 previews last?

WORK SPACE

ANSWER _____

2 In a game, a player's hit rate is shown as 0.888... . Write the hit rate as a fraction. If the player made 18 attempts, how many were hits?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Write 0.1232323... as a fraction in simplest form. Show two equations you can subtract to remove the repeating digits.

WORK SPACE AND ANSWER

ANSWER KEY

Decimals That Repeat

GRADE 8 · 8.NS.1b

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Write 0.777... as a fraction in simplest form.	**7/9**
2	Write 0.121212... as a fraction in simplest form.	**4/33**
3	Write 0.1666... as a fraction in simplest form.	**1/6**
4	Write 2.666... as a fraction in simplest form.	**8/3**
5	Write 0.2333... as a fraction in simplest form.	**7/30**
6	Write 0.08333... as a fraction in simplest form.	**1/12**

PART 2 · APPLY IT

1. **4/11 minute per preview; 8 minutes for 22 previews** Let x = 0.363636... . Then 100x − x = 36, so x = 36/99 = 4/11. Multiply 22 × 4/11 to get 8 minutes.
2. **8/9; 16 hits** The repeating decimal equals 8/9. Multiply 18 × 8/9 to get 16 hits.

CHALLENGE

Let x = 0.1232323... . Then 10x = 1.232323... and 1000x = 123.232323... . Subtract to get 990x = 122, so x = 122/990 = 61/495.

The dots mean the shown digit or group continues to repeat. Accept equivalent fractions for the word problems; practice answers must be in simplest form.