LESSON MAKER PRO

Decimal Detective

Turn repeating decimals into fractions.

GRADE 8 · 8.NS.A.1

CCSS.Math.Content.8.NS.A.1 "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 _____

THE BIG IDEA

Every number has a decimal expansion. A decimal that ends or repeats is rational, while a decimal that never ends and never repeats is irrational. Parentheses show the digits that repeat, and multiplication plus subtraction can turn a repeating decimal into a fraction.

WORKED EXAMPLE

Write 0.(7) as a fraction in simplest form.

1. Let x = 0.777...
2. Multiply by 10: 10x = 7.777...
3. Subtract: 10x - x = 7, so 9x = 7.
4. Divide by 9: x = 7/9.

Answer: 7/9

PRACTICE 6 problems

1 Write 0.(3) as a fraction in simplest form.

ANSWER _____

2 Write 0.(27) as a fraction in simplest form.

ANSWER _____

3 Write 0.1(6) as a fraction in simplest form.

ANSWER _____

4 Write 2.4(5) as a fraction in simplest form.

ANSWER _____

5 Write 0.08(3) as a fraction in simplest form.

ANSWER _____

6 Write 1.2(34) as a fraction in simplest form.

ANSWER _____

APPLY IT Show your work

1 A video-editing app shows that Maya's finished clip is 0.1(8) hour long. Write the clip length as a fraction of an hour in simplest form.

WORK SPACE

ANSWER _____

2 A game report displays a player's win rate as 0.(45). Write this win rate as a fraction in simplest form.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Write 3.0(27) as a fraction in simplest form. Explain why you multiply by two different powers of 10 before subtracting.

WORK SPACE AND ANSWER

ANSWER KEY # Decimal Detective

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Write 0.(3) as a fraction in simplest form.	**1/3**
2	Write 0.(27) as a fraction in simplest form.	**3/11**
3	Write 0.1(6) as a fraction in simplest form.	**1/6**
4	Write 2.4(5) as a fraction in simplest form.	**221/90**
5	Write 0.08(3) as a fraction in simplest form.	**1/12**
6	Write 1.2(34) as a fraction in simplest form.	**611/495**

PART 2 · APPLY IT

1. **17/90 hour** Let x = 0.1888.... Then 100x - 10x = 18 - 1, so 90x = 17 and x = 17/90.
2. **5/11** Let x = 0.4545.... Then 100x - x = 45, so 99x = 45 and x = 45/99 = 5/11.

CHALLENGE

333/110

Accept equivalent fractions if the conversion is correct, but students should simplify when directed. Parentheses mean that only the digits inside the parentheses repeat.