LESSON MAKER PRO

# Decimals That Last

*Divide to find out whether a decimal stops or repeats.*

**GRADE 7 · 7A.NS.B.10.a**

**7A.NS.B.10.a** "Explain that every number has a decimal expansion; for rational numbers, the decimal expansion repeats in a pattern or terminates."

NAME _____ DATE _____

## WATCH THE REMAINDER

Every number has a decimal expansion. To write a fraction as a decimal, divide its numerator by its denominator. If the remainder becomes zero, the decimal terminates. If a remainder repeats, the decimal digits repeat in a pattern.

**WORKED EXAMPLE**

Write 13/16 as a decimal. Does it terminate or repeat?

1. 13 ÷ 16 starts with 0. Then 130 ÷ 16 = 8 remainder 2.
2. 20 ÷ 16 = 1 remainder 4. Then 40 ÷ 16 = 2 remainder 8.
3. 80 ÷ 16 = 5 remainder 0, so the decimal stops.

**Answer: 13/16 = 0.8125, terminating.**

## PRACTICE 6 problems

**1** Write 3/8 as a decimal.

**ANSWER** _____

**2** Write 2/9 as a decimal. Does it terminate or repeat?

**ANSWER** _____

**3** A student writes 5/6 = 0.83. Write the exact decimal expansion. Is 0.83 exact?

**ANSWER** _____

**4** Write 7/20 as a decimal.

**ANSWER** _____

**5** Write 4/11 as a decimal. Which block of digits repeats?

**ANSWER** _____

**6** Write -5/12 as a decimal. Does it terminate or repeat?

**ANSWER** _____

## APPLY IT Show your work

**1** A game update downloads 3/5 of a gigabyte. Write this amount as a decimal number of gigabytes. Does the decimal terminate or repeat?

WORK SPACE

**ANSWER** _____

**2** A video editor has finished 2/3 of a short animation. Write the completed part as a decimal. Does the decimal terminate or repeat?

WORK SPACE

**ANSWER** _____

## CHALLENGE One step up

Write 7/12 as a decimal. Explain how a repeated remainder shows that its decimal repeats.

WORK SPACE AND ANSWER

**ANSWER KEY**

# Decimals That Last

**GRADE 7 · 7A.NS.B.10.a**

## PART 1 · PRACTICE

| # | PROBLEM | ANSWER |
|---|---|---|
| 1 | Write 3/8 as a decimal. | **0.375** |
| 2 | Write 2/9 as a decimal. Does it terminate or repeat? | **0.222..., repeating.** |
| 3 | A student writes 5/6 = 0.83. Write the exact decimal expansion. Is 0.83 exact? | **5/6 = 0.8333... . No, 0.83 is not exact.** |
| 4 | Write 7/20 as a decimal. | **0.35** |
| 5 | Write 4/11 as a decimal. Which block of digits repeats? | **0.363636...; the block 36 repeats.** |
| 6 | Write -5/12 as a decimal. Does it terminate or repeat? | **-0.41666..., repeating.** |

## PART 2 · APPLY IT

1. **0.6 gigabyte, terminating.** Divide 3 by 5 to get 0.6. The remainder is zero, so the decimal terminates.
2. **0.666..., repeating.** Dividing 2 by 3 gives a digit of 6 and a remainder of 2. That remainder repeats, so the digit 6 repeats.

## CHALLENGE

**7/12 = 0.58333... . After the digits 5 and 8, dividing 40 by 12 gives 3 remainder 4. The remainder 4 keeps returning, so the digit 3 repeats.**

Accept a bar over the correct repeating digit or block in place of an ellipsis. For the challenge, accept any explanation that identifies a repeated remainder of 4 and the repeating digit 3.