

Decimal Division Detectives

Use long division to find decimals that end or repeat.

GRADE 7 • NY-7.NS.2.d

NY-7.NS.2.d "Convert a fraction to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats."

NAME _____

DATE _____

THE BIG IDEA

Use long division to divide the numerator by the denominator. If the division ends with a remainder of 0, the decimal terminates, and you may add zeros after the last digit. If a remainder appears again, the same digits will repeat forever. Use parentheses to show repeating digits, such as $0.(3)$.

WORKED EXAMPLE

Convert $2/25$ to a decimal using long division.

1. 25 does not go into 2. Write 0. and bring down a 0 to make 20.
2. $20 \div 25 = 0$ remainder 20. Write 0 in the tenths place.
3. Bring down a 0: $200 \div 25 = 8$ remainder 0.
4. The remainder is 0, so the decimal terminates.

Answer: 0.08

PRACTICE 6 problems

- 1** Convert $3/4$ to a decimal. State whether it terminates or repeats.

ANSWER _____

- 2** Convert $5/6$ to a decimal. Use parentheses for the repeating digit.

ANSWER _____

- 3** Convert $11/12$ to a decimal. Use parentheses for the repeating digit.

ANSWER _____

- 4** Convert $-9/40$ to a decimal. State whether it terminates or repeats.

ANSWER _____

- 5** Convert $13/30$ to a decimal. Use parentheses for the repeating digit.

ANSWER _____

- 6** Convert $17/50$ to a decimal. State whether it terminates or repeats.

ANSWER _____

APPLY IT Show your work

- 1** During an online tournament, Jalen played for $\frac{19}{24}$ of an hour. Write $\frac{19}{24}$ as a decimal number of hours. Does the decimal terminate or repeat?

WORK SPACE

ANSWER _____

- 2** A design app shows that Priya has used $\frac{7}{32}$ of her monthly storage limit. Write $\frac{7}{32}$ as a decimal. Does the decimal terminate or repeat?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Without using a calculator, convert $\frac{23}{28}$ to a decimal using long division. Then explain why the decimal repeats rather than terminates.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Convert $\frac{3}{4}$ to a decimal. State whether it terminates or repeats.	0.75, terminates
2	Convert $\frac{5}{6}$ to a decimal. Use parentheses for the repeating digit.	0.8(3)
3	Convert $\frac{11}{12}$ to a decimal. Use parentheses for the repeating digit.	0.91(6)
4	Convert $-\frac{9}{40}$ to a decimal. State whether it terminates or repeats.	-0.225, terminates
5	Convert $\frac{13}{30}$ to a decimal. Use parentheses for the repeating digit.	0.4(3)
6	Convert $\frac{17}{50}$ to a decimal. State whether it terminates or repeats.	0.34, terminates

PART 2 • APPLY IT

- 0.791(6) hour, repeats** Divide 19 by 24 using long division. After 0.791, the remainder leads to 6 repeating.
- 0.21875, terminates** Divide 7 by 32 using long division. The division reaches a remainder of 0 after five decimal places.

CHALLENGE

0.82(142857). The remainder 4 appears again during long division, so the digits 142857 repeat.

Accept equivalent repeating-decimal notation with an ellipsis, such as 0.8333..., when the repeating digit or block is clear. Accept extra zeros after any terminating decimal.