

8.NS.1

How do you prove rational numbers using decimal expansion?

Fractions ---> Decimals

VOCABULARY

estimate

the digits behind the decimal continue and follow the same pattern

every decimal can be extended using a repeating digit. For all numbers that appear to terminate that repeating digit is 0 (Ex. $10 = 10.00000$)

APPROXIMATION-

DECIMAL EXPANSION-

REPEATING DECIMALS-

DISCOVER

*hint-Convert example fractions to decimals

GROUP ONE

What decimal do you get when you divide any single digit by 9?

Ex. $4/9$, $1/9$, $5/9$, $6/9$

GROUP TWO

What decimal do you get when you divide any double digit number by 99?

Ex. $55/99$, $23/99$, $67/99$, $81/99$

GROUP THREE

What decimal do you get when you divide any single digit number by 11?

Ex. $4/11$, $3/11$, $5/11$, $6/11$

JUSTIFY

What patterns did you notice?

9- _____

99- _____

11- _____

Are these numbers rational? Why or Why not?

Justify your discovery by creating 3 examples for each column:

9	99	11
		For now use single digits as your numerator

Practice

What would the following fractions be as decimals?

1. $\frac{4}{9}$

2. $\frac{53}{99}$

3. $\frac{7}{11}$

HINT:

Use denominators
9, 99 or 11



NOW turn these repeating decimals into fractions

4. $0.\overline{6}$

5. $0.\overline{12}$

6. $0.\overline{81}$

PRACTICE

FRACTIONS--> DECIMALS

6
9

8
9

68
99

53
99

What do 9s and 99s have
in common?

2
11

4
11

How are 11s different?

9, 99, 11 PATTERNS

ANY single digit NUMERATOR divided by 9 will be a
9 repeating decimal of JUST that NUMERATOR

ANY double digit NUMERATOR divided by 99 will be a
99 repeating decimal of JUST that NUMERATOR

ANY NUMERATOR divided by 11 will be a repeating
11 decimal of that NUMERATOR TIMES 9!

Prove that the following decimals is a rational number

You will figure out the steps to prove that a repeating decimal is a rational number as a class based on my work

Ex. $\overline{.1}$

Steps to prove rational numbers decimal expansion

Example 1

Change $\overline{.11}$ to a fraction.



Example 2

Change $\overline{.123}$ to a fraction



Critical Thinking

Your Try!

$$0.\overline{11} * \frac{2}{3}$$



$$0.\overline{11} + \frac{2}{3}$$



Exit Ticket

1. What is $\overline{0.2} * \frac{8}{9}$?

2. What is $\overline{0.2} + \frac{8}{9}$?

3. What is the decimal equivalent of $\frac{5}{11}$?

