

Lesson 14: Converting Rational Numbers to Decimals Using Long Division

Division

Classwork

Example 1: Can All Rational Numbers Be Written as Decimals?

- a. Using the division button on your calculator, explore various quotients of integers 1 through 11. Record your fraction representations and their corresponding decimal representations in the space below.
- b. What two types of decimals do you see?

Example 2: Decimal Representations of Rational Numbers

In the chart below, organize the fractions and their corresponding decimal representation listed in Example 1 according to their type of decimal.

What do these fractions have in common?	What do these fractions have in common?
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Example 4: Converting Rational Numbers to Decimals Using Long-Division

Use long division to find the decimal representation of $\frac{1}{3}$.

Exercise 2

Calculate the decimal values of the fraction below using long division. Express your answers using bars over the shortest sequence of repeating digits.

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

b. $\frac{1}{11}$

Lesson Summary

The real world requires that we represent rational numbers in different ways depending on the context of a situation. All rational numbers can be represented as either terminating decimals or repeating decimals using the long division algorithm. We represent repeating decimals by placing a bar over the shortest sequence of repeating digits.

Problem Set

1. Convert each rational number into its decimal form:

		$\frac{1}{9} =$ _____
	$\frac{1}{6} =$ _____	$\frac{2}{9} =$ _____
$\frac{1}{3} =$ _____	$\frac{2}{6} =$ _____	$\frac{3}{9} =$ _____
		$\frac{4}{9} =$ _____
	$\frac{3}{6} =$ _____	$\frac{5}{9} =$ _____
$\frac{2}{3} =$ _____	$\frac{4}{6} =$ _____	$\frac{6}{9} =$ _____
		$\frac{7}{9} =$ _____
	$\frac{5}{6} =$ _____	$\frac{8}{9} =$ _____

One of these decimal representations is not like the others. Why?