**Lesson 23: Decimals**

**Answer Key**

Mathematicians denote the separation point of the unit’s digit and the tenths digit by writing a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

ten

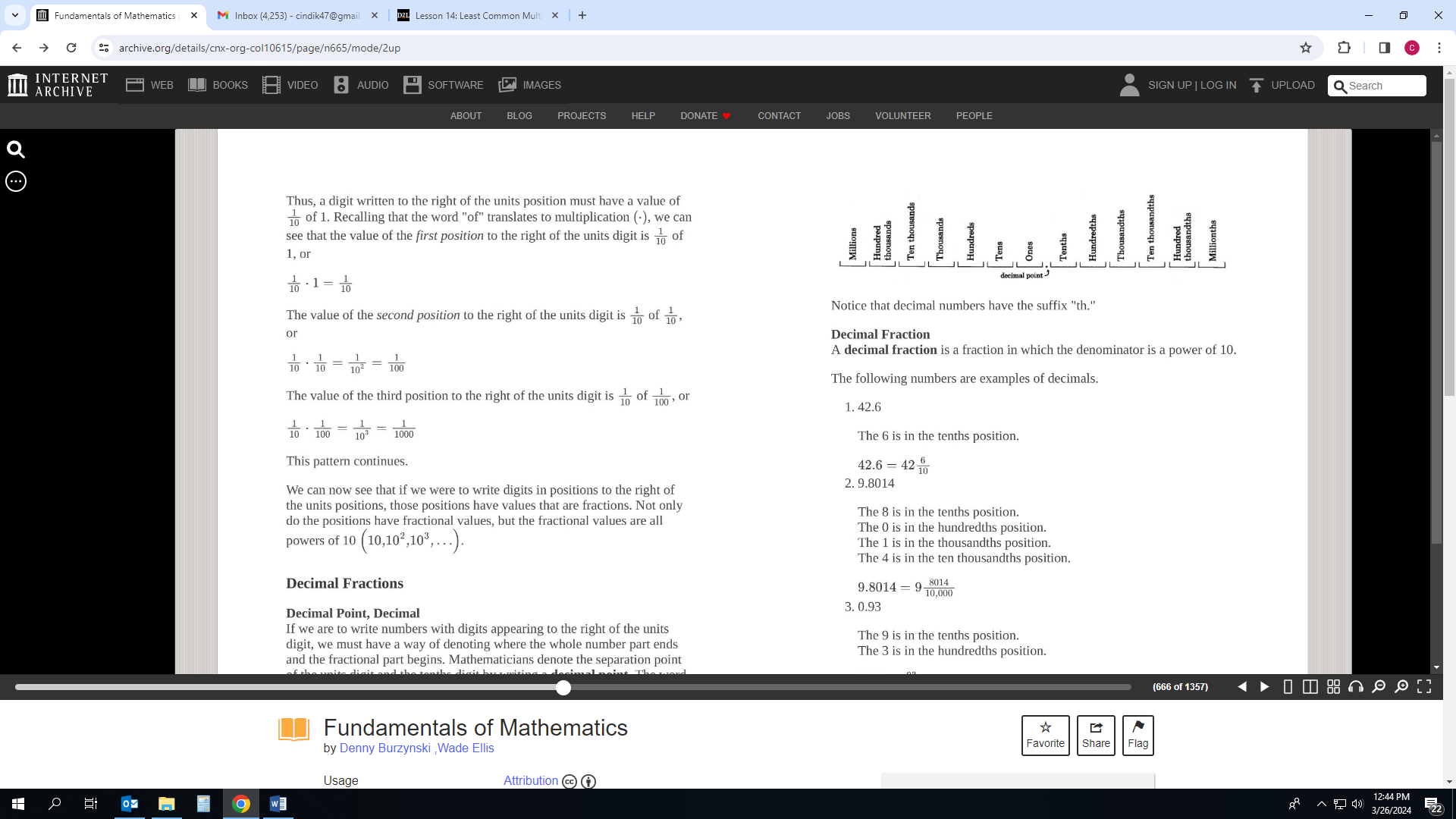
decimal point

The word decimal comes from the Latin prefix “deci” which means \_\_\_\_\_\_\_\_\_. We use it because we have a base ten number system.

decimal fractions

Numbers written in this form are called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or simply \_\_\_\_\_\_\_\_\_\_.

decimals



Positions to the left of the decimal point represent place values that are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ powers of ten.

increasing

Positions to the right of the decimal point represent place values that are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ powers of ten.

decreasing

**Reading and Writing Decimals**

1. Read the whole number part as usual. If the whole number is less than 1, omit steps 1 and 2.
2. Read the decimal point as the word “and”.
3. Read the number to the right as if it were a whole number.
4. Say the name of the place value of the last digit.

**Example 1: Write the name of each decimal.**

1. 8.8951

* Eight and eight thousand, nine hundred, fifty-one ten thousandths

1. 18.25
   * Eighteen and twenty-five hundredths

**Expressing Decimal Fractions**

**Example 2: Express the value of the underlined digit as a fraction whose denominator is a power of 10.**

1. 47.35 b) 6.089 c) 14.37

Like whole numbers, decimals can be written in expanded form.

**Example 3: Write the expanded form of the decimal to show the powers of 10: 98.32.**

9 x 101 + 8 x 100 + 3 x 10-1 + 2 x 10-2

**Inequality and Equality of Decimals**

* To compare decimals, start with the greatest place value and determine which number is greatest.
* If the digits are the same, compare the digits in the next place value to the right.
* Keep comparing digits with the same place value until you find digits that are different.

**Example 4: Compare the following decimals using ˂ or ˃.**

˃

˃

˂

1. .47 \_\_\_\_\_ .6 b) .74 \_\_\_\_\_ .328 c) .324 \_\_\_\_\_ .32

˃

˂

d) 5.4 \_\_\_\_\_ 5.427 e) 3.85 \_\_\_\_\_ 3.8

**Example 5: Which number is the greatest?**

a) 0.19 b) 0.036 c) 0.195 d) 0.2 Answer: 0.2

**Terminating and Repeating Decimals**

Terminating Decimal: A fraction is a terminating decimal if the denominator has prime factors of only 2’s and 5’s.

Repeating Decimal: A fraction is a repeating decimal if the denominator has prime factors other than 2’s and 5’s.

**Example 6:** Does the fraction terminate or repeat?

The factors of 80: 24, 5

Terminates

0.0125

Reduce

Terminates

0.6

The factors of 6: 2, 3; Repeats

0.83

1. b) c)

d) e)

The factors of 15: 3, 5

Repeats

0.46

The factors of 14: 2, 7

Repeats

0.2142857

**Repetend**: Repeating digits of a repeating decimal

**Example 7: Write the decimal for each rational number. Use a bar to show the repetend.**

1. b) c)

0.27 0.3 0.416

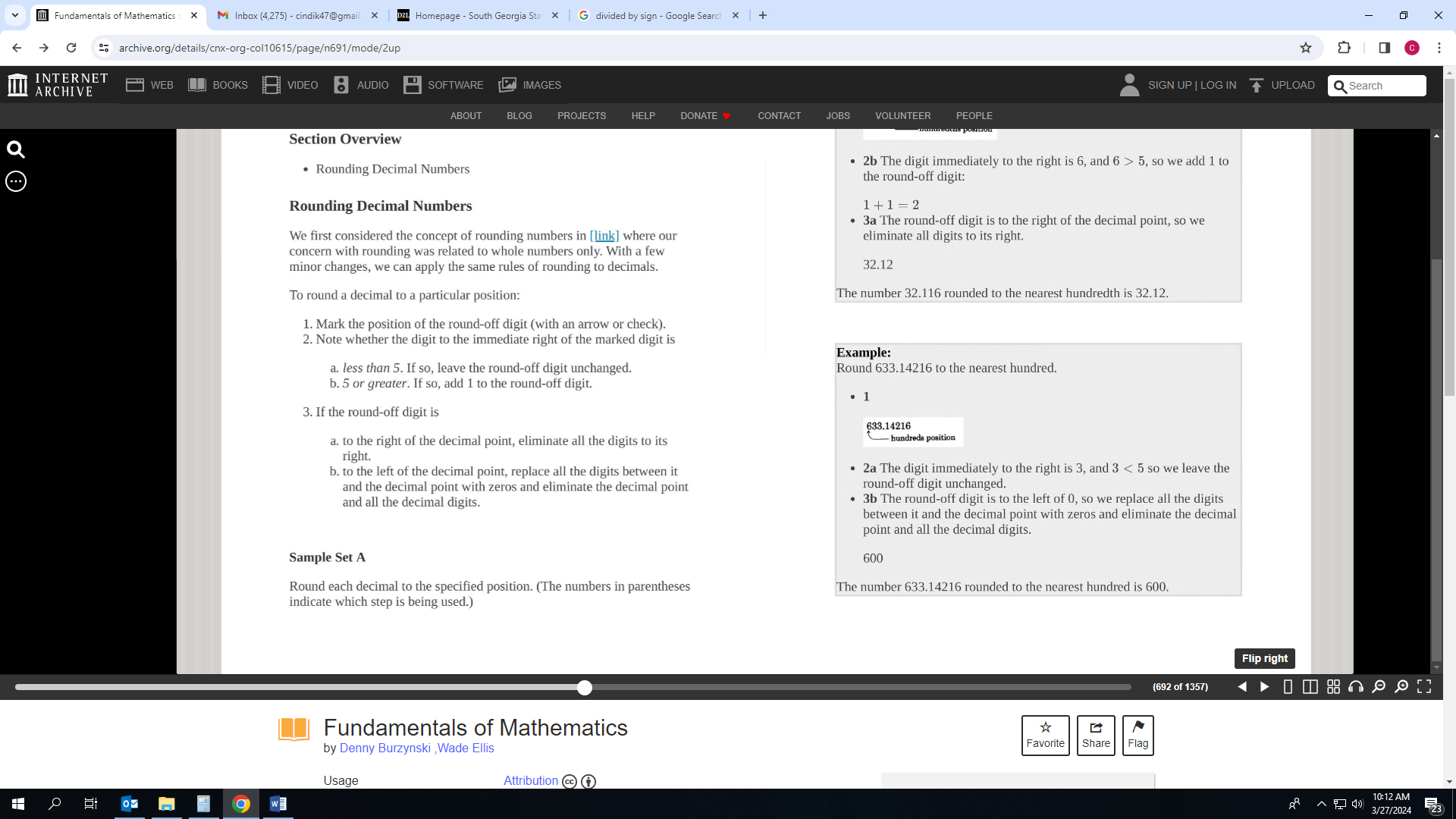
**Rounding Decimals**

**Rules for rounding a decimal to a particular place value:**

* Locate the place value to which the number is to be rounded (with an arrow or check)
* Note whether the digit to the immediate right of the marked digit is

1. ***4 or less.*** Drop all digits to the right and the number stays the same.
2. ***5 or greater****.* All digits are dropped and increase the place value number by one.

**Example 9:** 633.14216



**Example 10: Round each decimal to the nearest tenth and to the nearest hundredth.**

1. 0.347 b) 0.082 c) 15.721

Tenth 0.3 Tenth 0.1 Tenth 15.7

Hundredth 0.35 Hundredth 0.08 Hundredth 15.72

**Example 11: Round 2.3528 to the given number of decimal places.**

1. To hundredths b) To tenths c) To thousandths

2.35 2.4 2.353