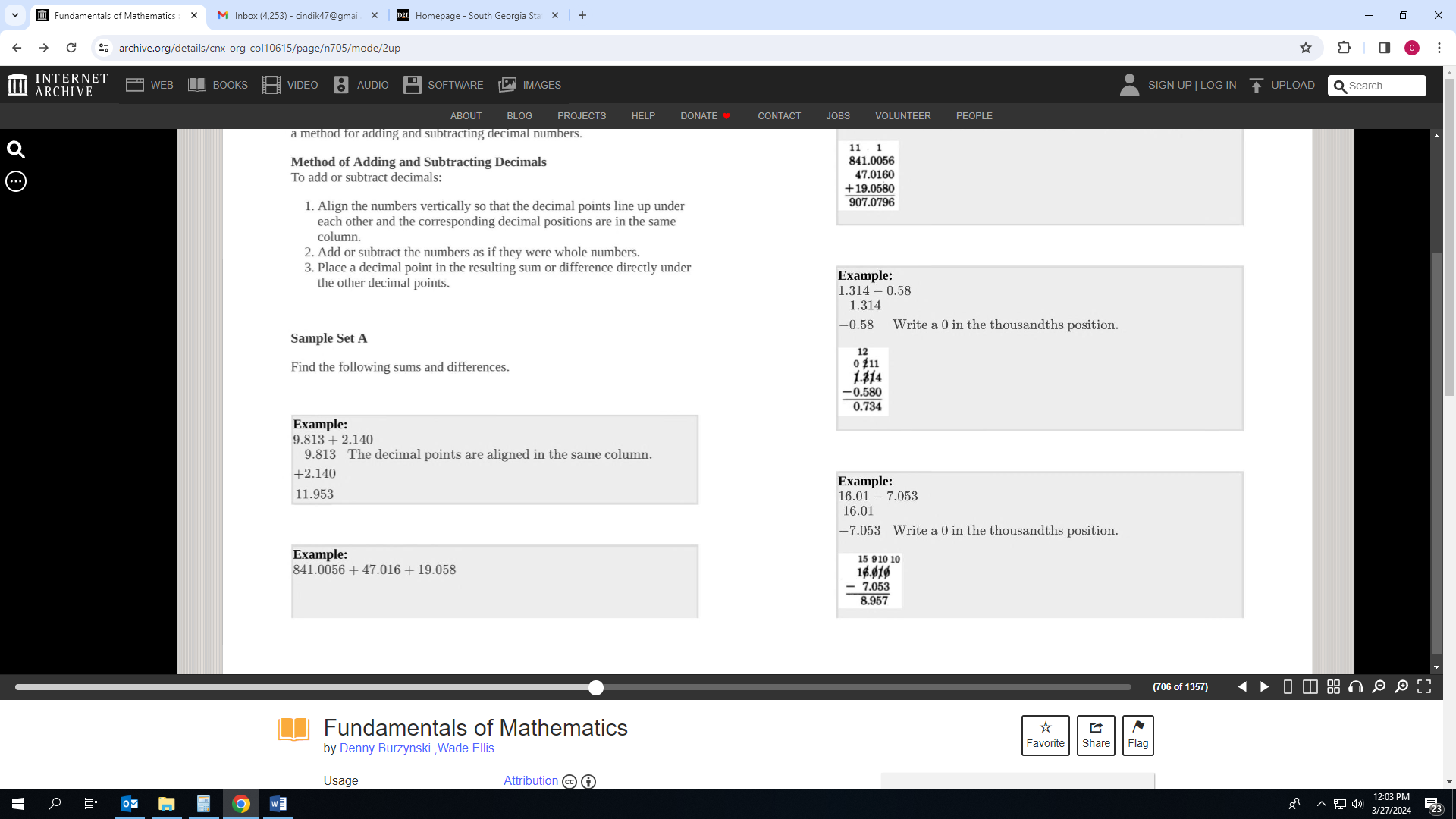
**Lesson 24: Operations With Decimals**

**Answer Key**

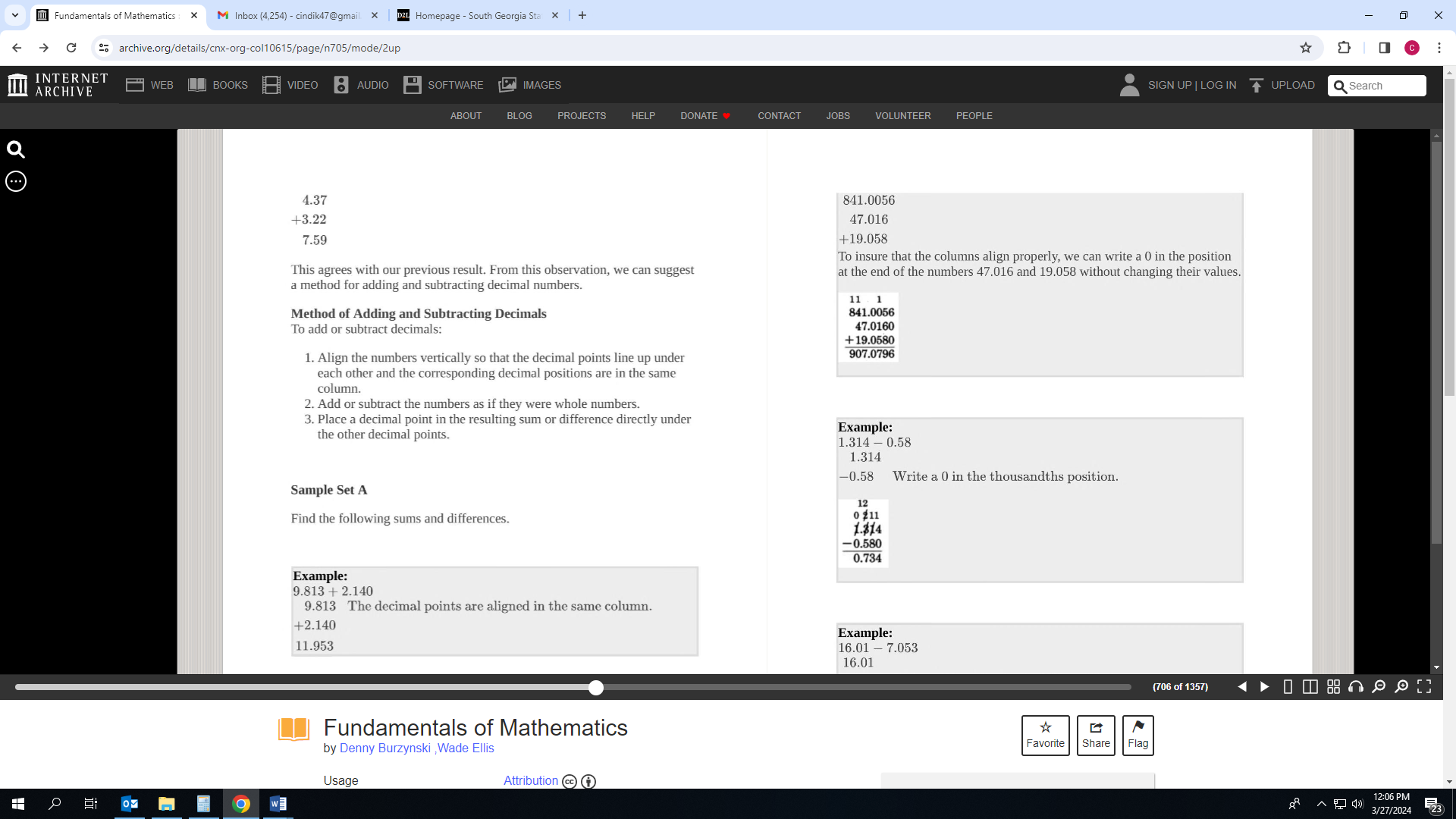
**Addition and Subtraction of Decimals**

**To Add or Subtract Decimals:**

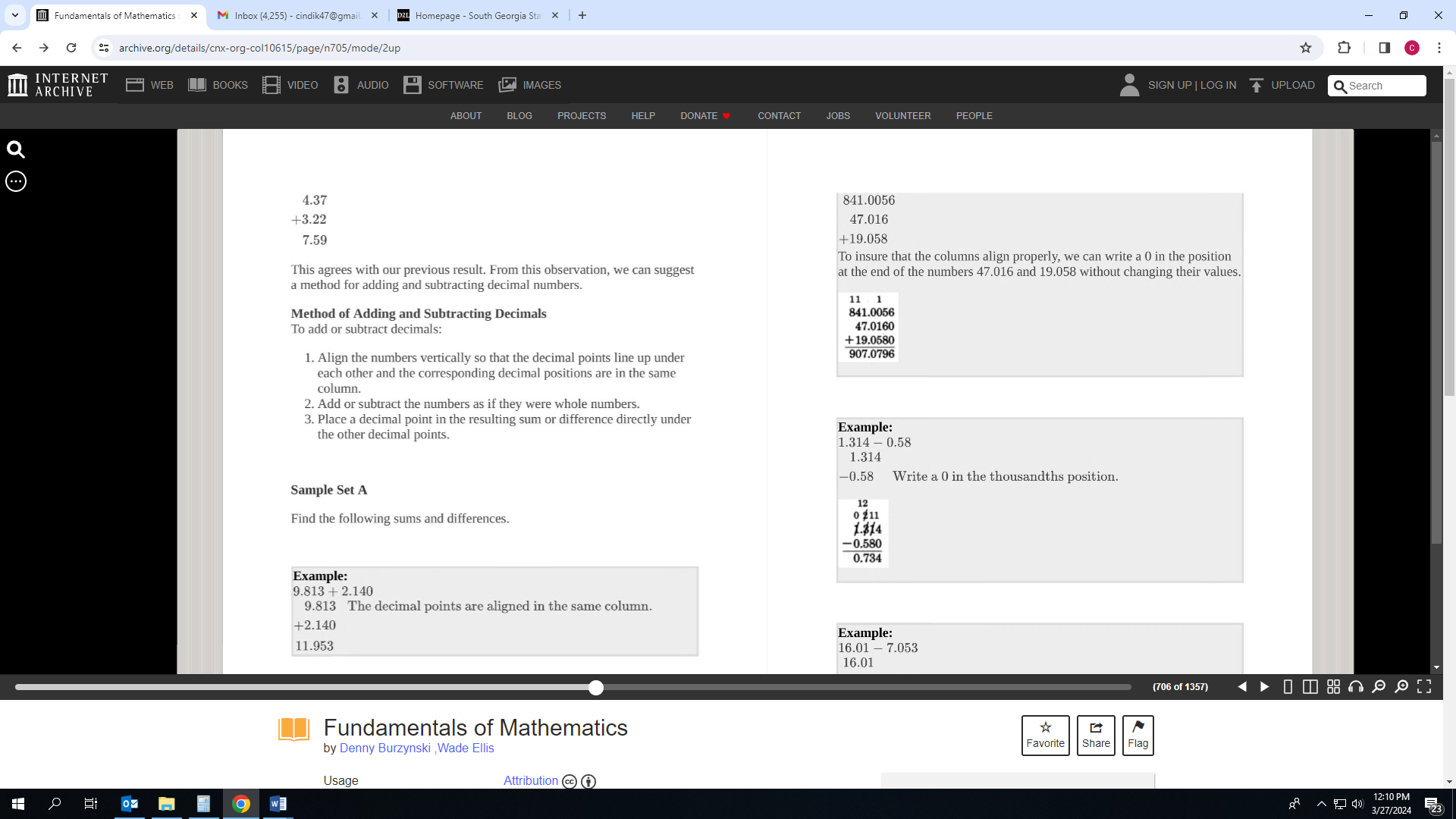
* Align the numbers vertically so that the decimal points line up under each other and the corresponding decimals positions are in the same column (tenths under tenths, hundredths under hundredths, etc.)
* Add or subtract the numbers as if they were whole numbers.
* Place a decimal point in the resulting sum or difference directly under the other decimal points.

**Example 1:** **Add 9.813 + 2.140.**

**Example 2: Add 841.0056 + 47.016 + 19.058.**



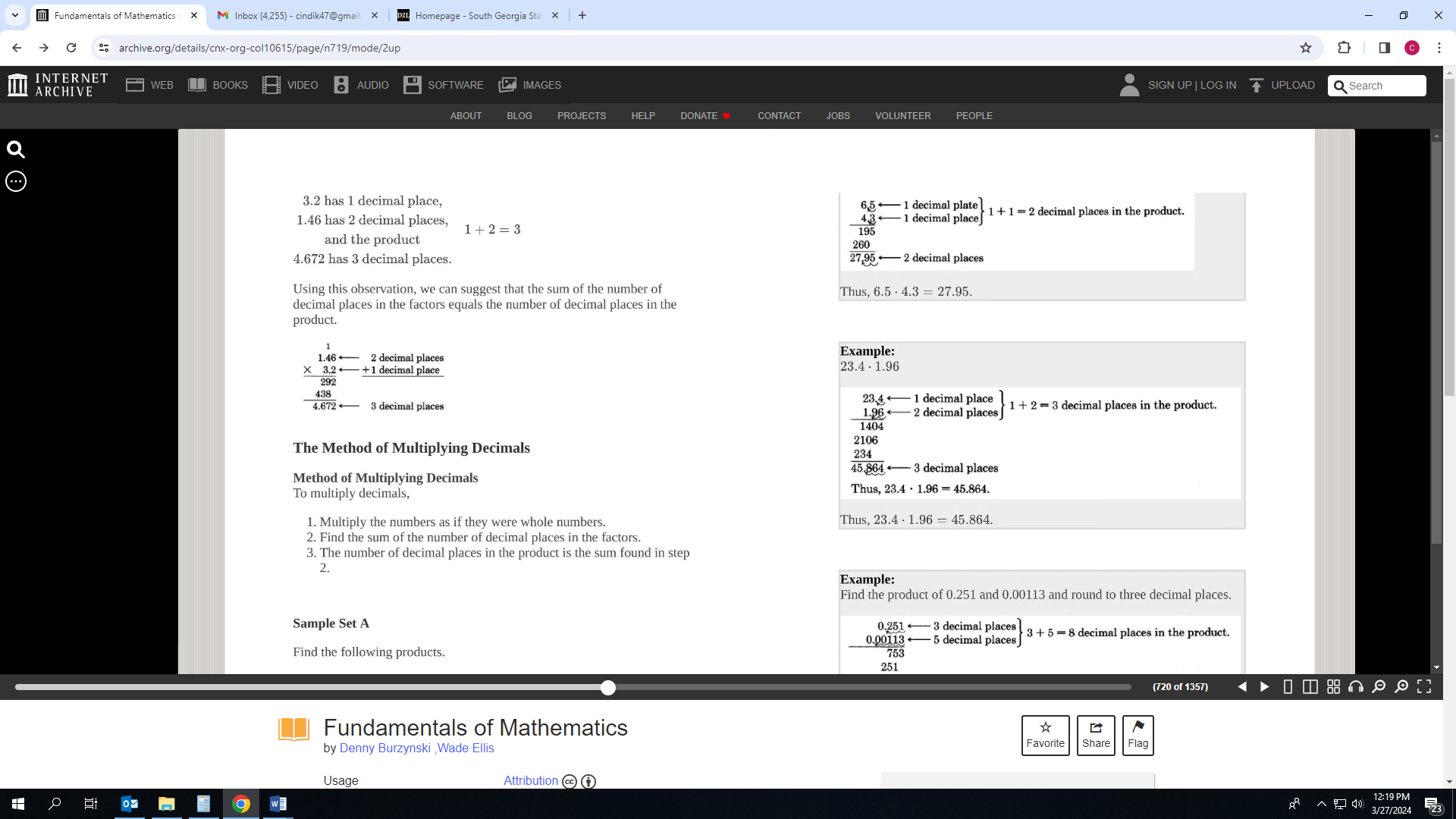
**Example 3: Subtract 1.314 – 0.58.**



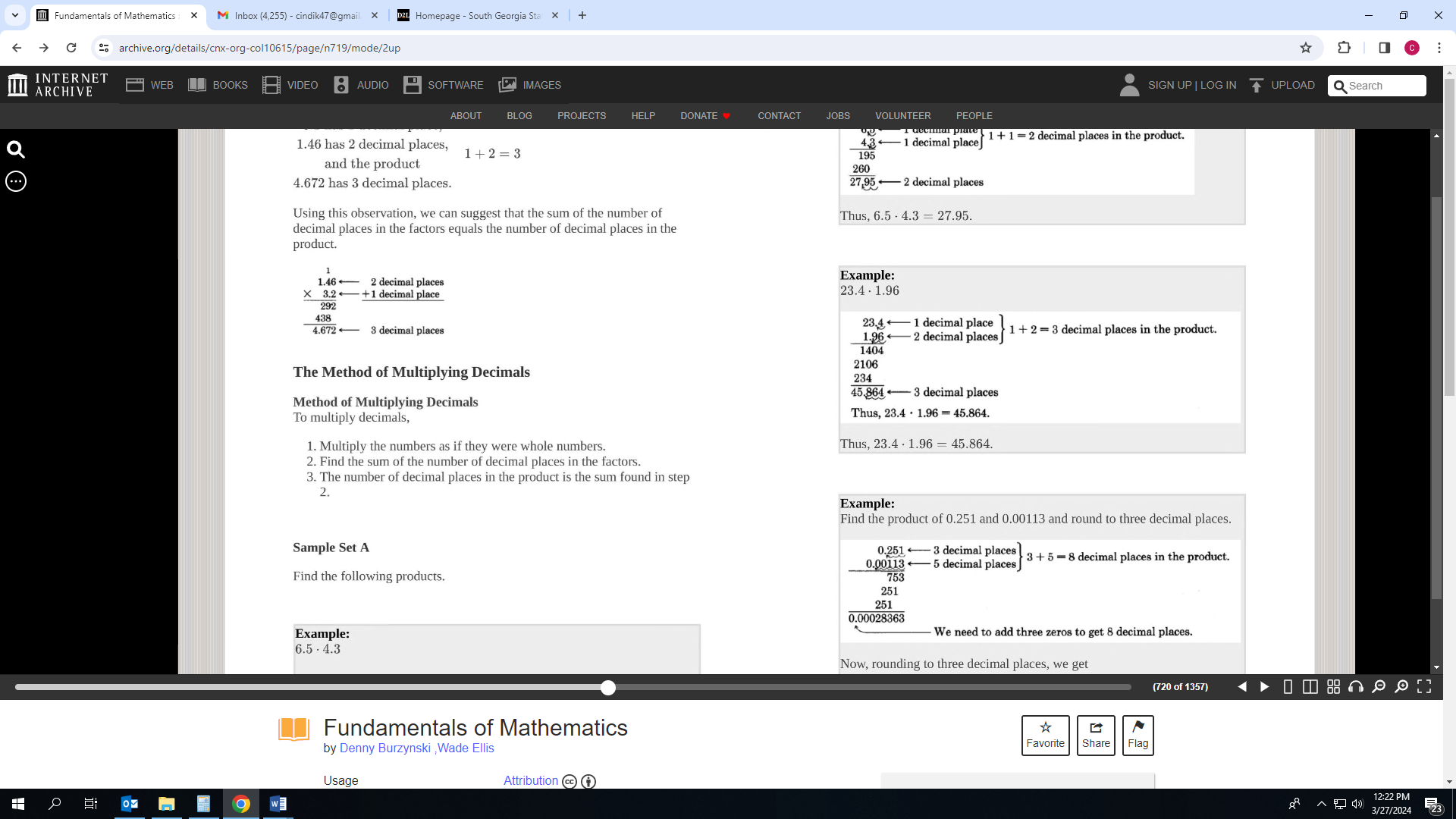
**Multiplication of Decimals**

**To Multiply Decimals:**

* Multiply the numbers as if they were whole numbers.
* Find the sum of the numbers of decimal places in the factors.
* Place the decimal point in the product in the correct place based on the sum of the decimal places in the factors.

**Example 4:** **Find the Product of 1.46 · 3.2.**

**Example 5:** **Find the Product of 0.251 · 0.00113.**



**Multiplying by POWERS of 10**

To multiply by a power of 10, move the decimal point one place to the right for each power of 10 if the exponent is positive and one place to the left for each power of 10 if the exponent is negative.

**Example 6:** **Multiply by POWERS of 10 without using a calculator.**

.39 · 102 = 39

.274 · 101 = 2.74

1. .274 · 10 b) .39 · 100

15.32 · 103 = 15,320

c) 15.32 · 1000 d) 42.3 · .01

42.3 · 10-2 = 0.423

**Division of Decimals**

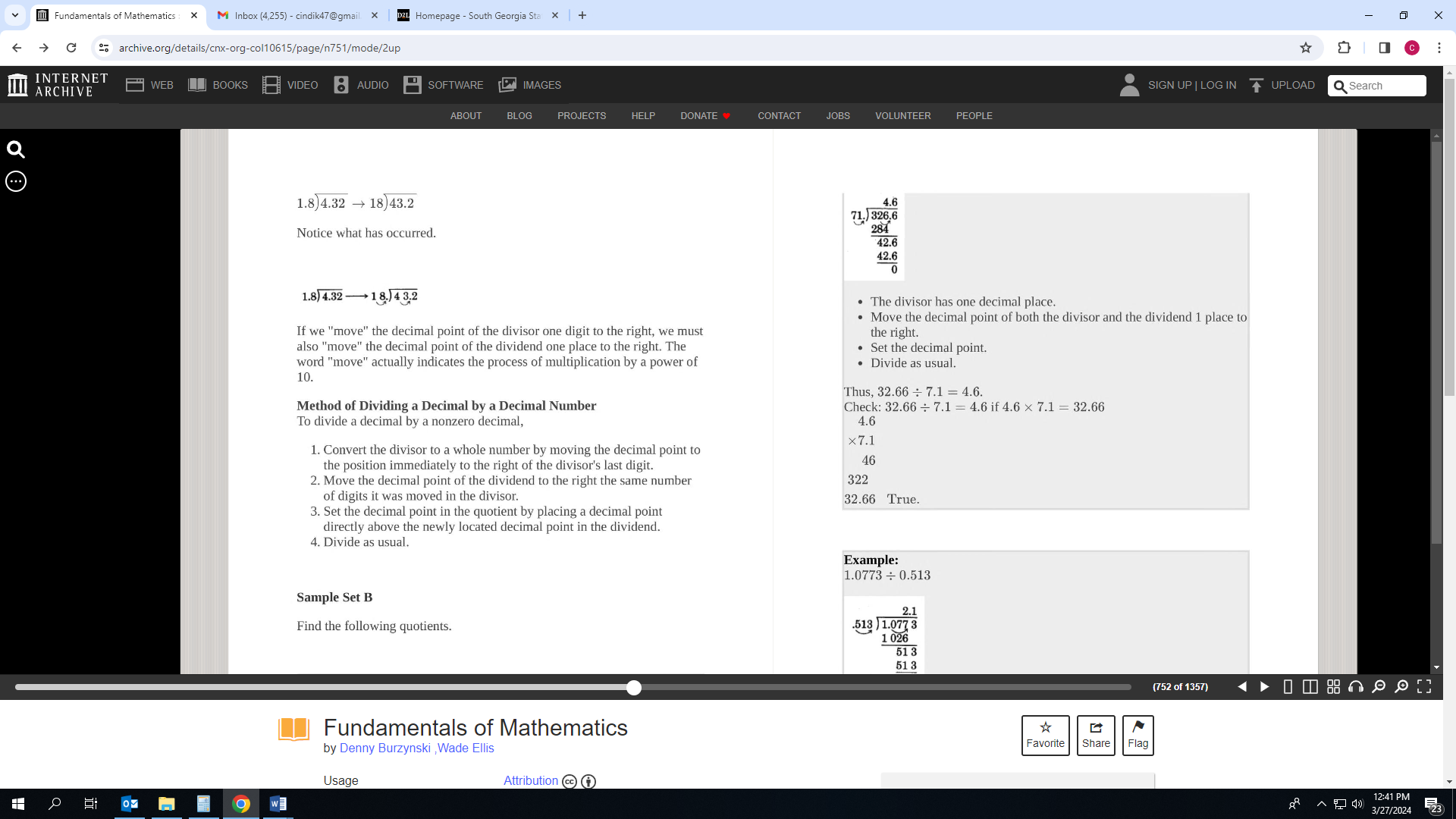
**To Divide a Decimal:**

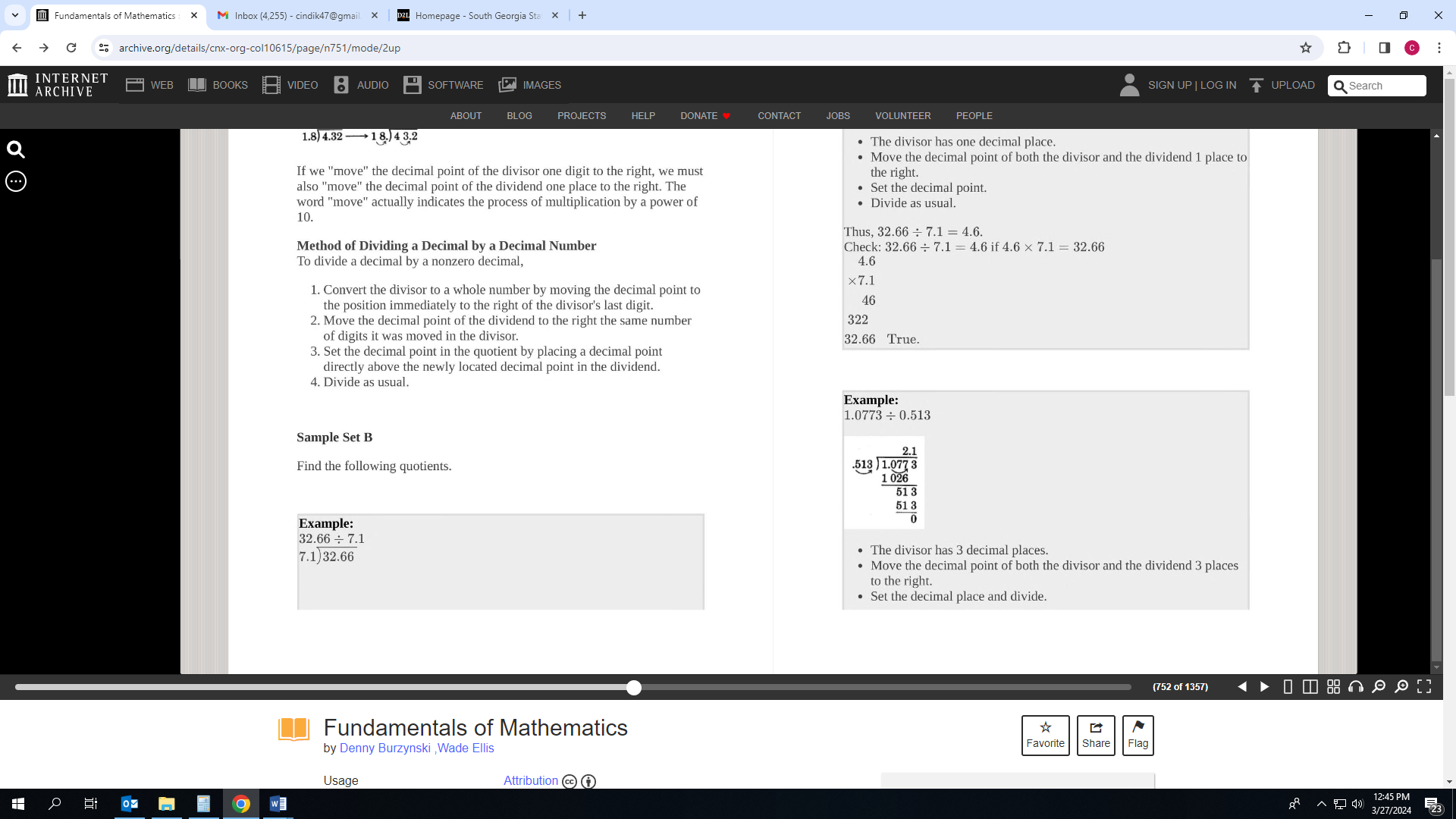
In long division for dividing decimals, we never actually divide by a decimal.

Before we divide and adjustment is made so that the divisor is always a whole number.

* The rule for dividing by a decimal is to count the number of decimal places in the divisor and then move the decimal points in the divisor and the dividend that many places to the right.

**Example 7: Find the Quotient of 32.66 ÷ 7.1.**



**Example 8: Find the Quotient of 1.0773 ÷ 0.513.**

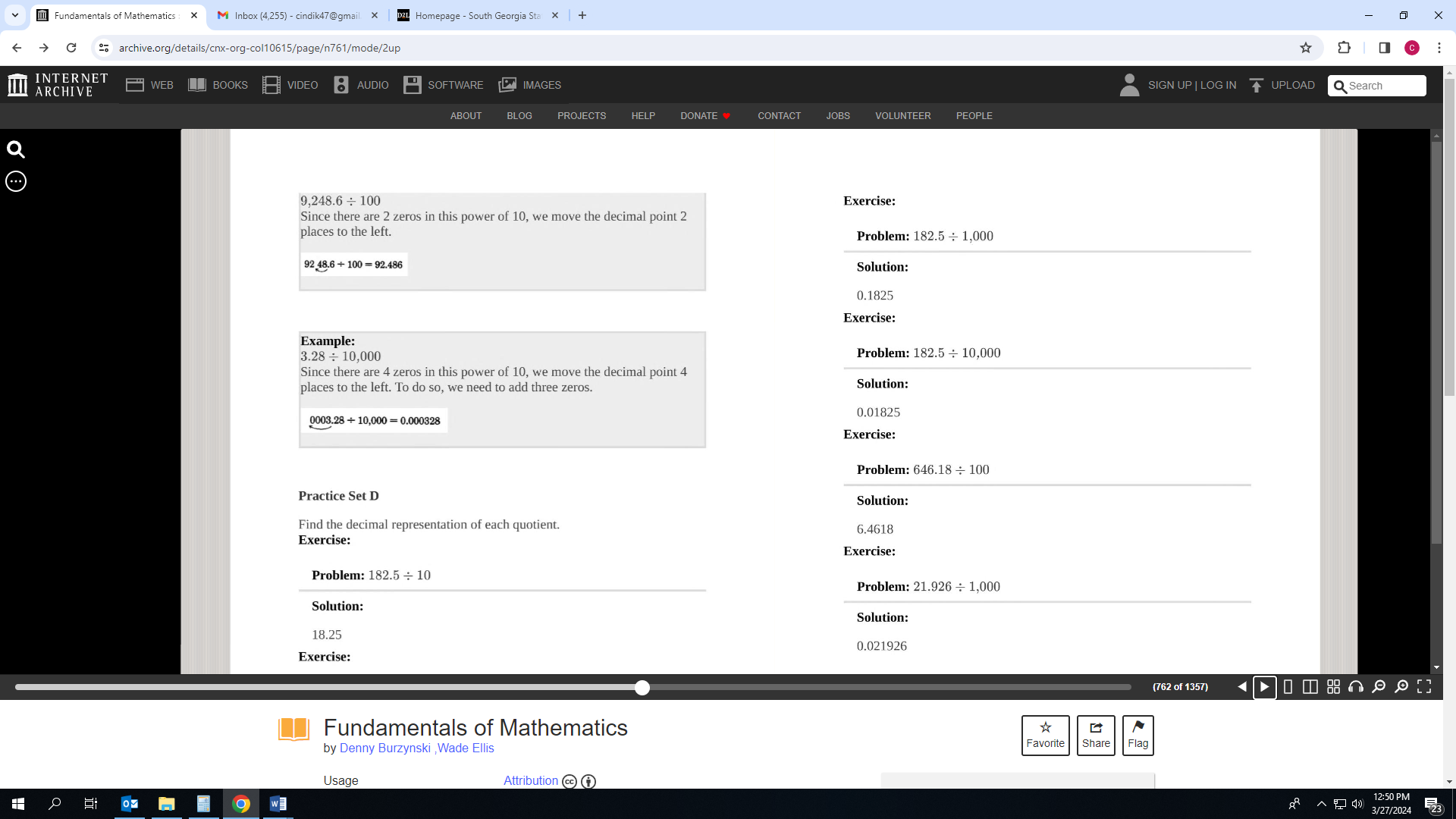
**Dividing by POWERS of 10**

To divide a decimal by a power of 10:

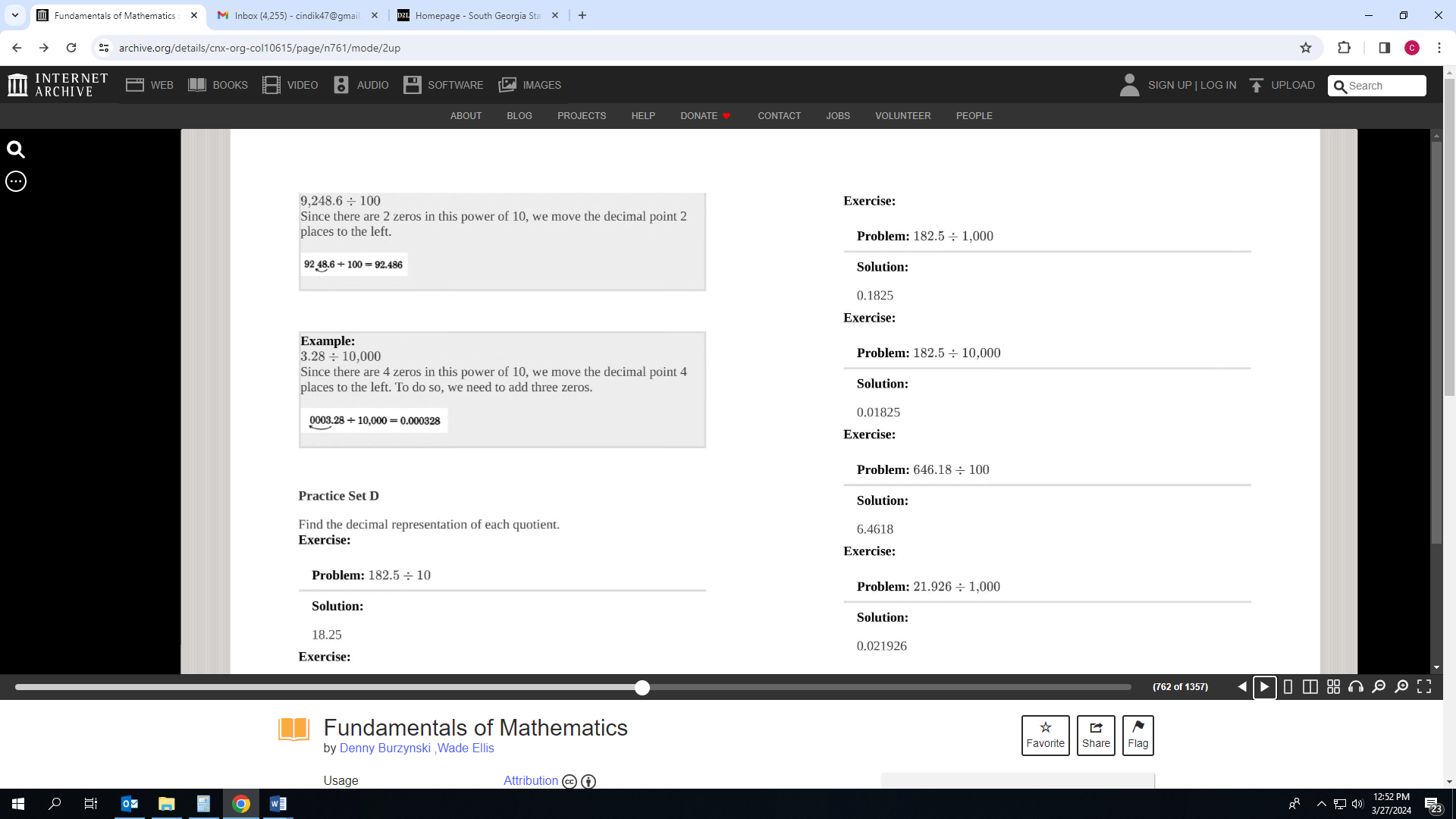
* move the decimal point one place to the left for each power of ten if the exponent is positive

or

* move the decimal point one place to the right for each power of ten if the exponent is negative.

**Example 9: 9,248.6 ÷ 100**

**Example 10: 3.28 ÷ 10,000**



**Example 11: 4.52 ÷ .001**

**.001 = 10-3**

**Move the decimal three places to the right.**

**4520**

**Repeating Decimals**

A repeating decimal can be written as a fraction whose numerators and denominators are integers.

repeats

terminates

A fraction, when *divided*, either \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Therefore, a terminating decimal can be converted back into a fraction AND a repeating decimal can be converted back into a fraction.

**Example 12: Rewrite 0.47 as a fraction.**

**Tips for converting a Repeating Decimal back into a Fraction:**

**.88888… = .8 tenths place**

**.55555… = .5 tenths place**

**.05050505… = .05 hundredths place**

**.376376376376… = .376 thousandths place**

**Example 13: Replace each repeating decimal with a rational number.**

1. **. 17 b) .7 c) .238 d) .18**

**e) .32 f) .8 g) .631**

**Common Decimal Equivalents**

Sometimes in computing products mentally it helps to recognize decimal equivalents of a few simple fractions. These are considered to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

compatible numbers

**Example 14: Find the Common Decimal Equivalents.**

**a) 0.25 =**

**b) 0.2 =**

**c) 0.8 =**

**d) 0.5 =**

**e) 0.4 =**

**f) 0.125 =**

**g) 0.75 =**

**h) 0.6 =**