Lesson 13: Converting Between Fractions and Decimals Using Equivalent Fractions

Classwork

Example 1: Representations of Rational Numbers in the Real World

Following the Opening Exercise and class discussion, describe why we need to know how to represent rational numbers in different ways.

Example 2: Using Place Values to Write (Terminating) Decimals as Equivalent Fractions

a. What is the value of the number 2.25? How can this number be written as a fraction or mixed number?

b. Rewrite the fraction in its simplest form showing all steps that you use.

c. What is the value of the number 2.025? How can this number be written as a mixed number?

d. Rewrite the fraction in its simplest form showing all steps that you use.

Exercise 1

Use place value to convert each terminating decimal to a fraction. Then rewrite each fraction in its simplest form.

a.   0.218

b.   0.16

c.   2.72

d.   0.0005

Example 3: Converting Fractions to Decimals—Fractions with Denominators Having Factors of only 2 or 5
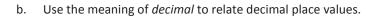
a.   What are *decimals*?

b.　Use the meaning of *decimal* to relate decimal place values.

c.　Write the number $\dfrac{3}{100}$ as a decimal. Describe your process.

d.　Write the number $\dfrac{3}{20}$ as a decimal. Describe your process.

e.　Write the number $\dfrac{10}{25}$ as a decimal. Describe your process.

f.　Write the number $\dfrac{8}{40}$ as a decimal. Describe your process.

Exercise 2

Convert each fraction to a decimal using an equivalent fraction.

a. $\dfrac{3}{16} =$

b. $\dfrac{7}{5} =$

c. $\dfrac{11}{32} =$

d. $\dfrac{35}{50} =$

Lesson Summary

Any terminating decimal can be converted to a fraction using place value (e.g., 0.35 is thirty-five hundredths or $\frac{35}{100}$). A fraction whose denominator includes only factors of 2 and 5 can be converted to a decimal by writing the denominator as a power of ten.

Problem Set

1. Convert each terminating decimal to a fraction in its simplest form.

   a. 0.4

   b. 0.16

   c. 0.625

   d. 0.08

   e. 0.012

2. Convert each fraction or mixed number to a decimal using an equivalent fraction.

   a. $\frac{4}{5}$

   b. $\frac{3}{40}$

   c. $\frac{8}{200}$

   d. $3\frac{5}{16}$

3. Tanja is converting a fraction into a decimal by finding an equivalent fraction that has a power of 10 in the denominator. Sara looks at the last step in Tanja's work (shown below) and says that she cannot go any further. Is Sara correct? If she is, explain why. If Sara is incorrect, complete the remaining steps.

$$\frac{72}{480} = \frac{2^3 \cdot 3^2}{2^5 \cdot 3 \cdot 5}$$