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Fractions, Decimals, and Percentages

Unit 6 Lesson 5

Students will be able to:

Define, differentiate and convert fraction, decimal and percent.

Key Vocabulary:

- Fraction
- Improper Fraction
- Proper Fraction
- Mixed Numbers
- Decimals
- Terminating Decimals
- Repeating Decimals
- Percent

FRACTIONS, DECIMALS, AND PERCENTAGES

DEFINITION OF TERMS

Fraction

- The symbol a/b , where a , b are natural numbers and $b \neq 0$, is called a fraction. The number above the bar is called numerator and the number below the bar is the denominator.
- A ***proper fraction*** is a fraction in which the numerator is less than the denominator.
- An ***improper fraction*** is a fraction in which the numerator is greater than or equal to the denominator.
- A ***mixed number*** is composed of a whole number and a fraction.

FRACTIONS, DECIMALS, AND PERCENTAGES

DEFINITION OF TERMS

Decimal

- A **decimal** is a fraction whose denominator can be expressed as a power of ten.
- A **terminating decimal** is the quotient obtained by dividing the numerator of a fraction by denominator with a remainder of zero.
- A **repeating decimal** is the representation of a fraction in which a pattern of digit repeats itself indefinitely.
- A **non-repeating and non-terminating** decimal is a decimal in which none of its digits repeat successively.

DEFINITION OF TERMS

Percent

- Percent is a ratio of a given number to 100. This means that a percent is the numerator of a fraction whose denominator is 100.

CHANGING FRACTION TO DECIMAL

Example 1:

Determine a decimal that denotes $\frac{1597}{250}$

Solution:

$$\frac{1597}{250} = 1597 \div 250 = 6.388$$

FRACTIONS, DECIMALS, AND PERCENTAGES

Sample Problem 1: Convert the following fraction to decimal

1. $\frac{21}{40}$

$$\begin{array}{r} .525 \\ 40 \overline{) 210} \\ \underline{200} \\ 100 \\ \underline{80} \\ 200 \\ \underline{200} \\ 0 \end{array} \quad \begin{array}{l} \text{Terminating} \\ \text{Decimals} \end{array}$$

2. $\frac{1}{3}$

$$\begin{array}{r} .333\dots \\ 3 \overline{) 10} \\ \underline{9} \\ 10 \\ \underline{9} \\ 10 \\ \underline{9} \\ 1 \end{array} \quad \begin{array}{l} \text{Repeating} \\ \text{Decimals} \end{array}$$

FRACTIONS, DECIMALS, AND PERCENTAGES

CHANGING DECIMALS TO FRACTION

Example 2:

To convert a terminating decimal the denominator depends on their position from the decimal point.

Convert 0.08 to fraction.

$$0.08 = \frac{8}{100} = \frac{2}{25}$$

CHANGING DECIMALS TO FRACTION

For a repeating decimal, the numerator is the repeating digit and the denominator is 9...9 (depends on how many digits are repeated)

Example 3:

Convert $0.\overline{27}$ To fraction

$$0.\overline{27} = \frac{27}{99} = \frac{3}{11}$$

CHANGING DECIMALS TO FRACTION

For a mixed repeating decimal, the numerator is equal to the digits of the decimal minus the non-repeating digits while denominator is 9 for each repeating decimal and zero for non-repeating decimals.

Example 4:

Convert $0.12\overline{37}$ to fraction

$$0.12\overline{37} = \frac{1237 - 12}{9900} = \frac{1225}{9900} = \frac{49}{360}$$

Sample Problem 2:

Change the following decimals into fraction.

1. 0.125

Solution:

$$1. 0.125 = \frac{125}{1000} = \frac{1}{8}$$

2. $2.\overline{545}$

$$2. 2.\overline{545} = 2\frac{545}{999}$$

3. $0.\overline{1471}$

$$3. 0.\overline{1471} = \frac{1471 - 1}{9990} = \frac{1470}{9990} = \frac{49}{333}$$

CHANGING PERCENT TO DECIMAL

Example 5: Write each percent to decimal form.

1. 16%

2. $66\frac{2}{3}\%$

Solution:

$$1. 16\% = \frac{16\%}{100\%} = 0.16$$

$$2. 66\frac{2}{3}\% = \frac{200}{3}\% \div 100\% = \frac{200}{300} = \frac{2}{3} = 0.\overline{6}$$

FRACTIONS, DECIMALS, AND PERCENTAGES

Sample Problem 3:

Write each percent to decimal form.

1. 7.2%

2. $\frac{1}{2}\%$

Solution:

$$1. \frac{7.2\%}{100\%} = \mathbf{0.072}$$

$$2. \frac{1}{2}\% \div 100\% = \frac{1}{200} = \mathbf{0.005}$$