FRACTION CONVERSION

Warm Up

Write each fraction in the simplest form.

1. $\frac{4}{12}$ $\frac{1}{3}$

2. $\frac{18}{46}$ $\frac{9}{23}$

3. $\frac{21}{63}$ $\frac{1}{3}$

4. $\frac{100}{72}$ $\frac{25}{18}$ or $1\frac{7}{18}$

Learn to write fractions as decimals, and vice versa, and to determine whether a decimal is terminating or repeating.

Vocabulary

Terminating decimal

Repeating decimal

Non-terminating decimal

Non-repeating decimal

Terminating Decimal

- A decimal that ends with a specific digit
- Examples:
- 2.6
- 5.3566
- 0.003

Repeating Decimal

- A decimal with one or more repeating digit
- Examples:
- 0.33333……or $0.\overline{3}$
- 2.77777……or 2.7
- 37.121212……..or $37.\overline{12}$
- 8.66666……or $8.\overline{6}$

Non-terminating Decimal

- A decimal that does not end or repeat
- Examples:
- π = Approximately 3 .41592653589793238 46……
- $\sqrt{5}$ Approximately 2.236067976……

Non-repeating Decimal

- A decimal that does not repeat
- Examples:
- π = Approximately 3.14159265358979323846……
- 2.131331333133333……

Converting Fraction into decimal Form (First Method)

Step 1: Find a number you can multiply by the bottom of the fraction to make it 10, or 100, or 1000, or any 1 followed by 0s.

Step 2: Multiply both top and bottom by that number.

Step 3. Then write down just the top number, putting the decimal place in the correct spot (one space from the right for every zero in the bottom number)

Example 2: Using Mental Math to Write Fractions as Decimals

Write each fraction as a decimal.

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

$$\frac{4}{5} \times \frac{2}{2} = \frac{8}{10}$$

Multiply to get a power of ten in the denominator.

$$= 0.8$$

B. $\frac{37}{50}$

$$\frac{37}{50} \times \frac{2}{2} = \frac{74}{100}$$

Multiply to get a power of ten in the denominator.

$$= 0.74$$

Check It Out: Example 2

Write each fraction as a decimal.

A. $\frac{3}{5}$

$\frac{3}{5} \times \frac{2}{2} = \frac{6}{10}$ *Multiply to get a power of ten in the denominator.*

$= 0.6$

B. $\frac{18}{25}$

$\frac{18}{25} \times \frac{4}{4} = \frac{72}{100}$ *Multiply to get a power of ten in the denominator.*

$= 0.72$

Converting fractions to decimals (Second Method.)

Example 1: Writing Fractions as Decimals

- Write each fraction as a decimal. Round to the
- nearest hundredth, if necessary.

A. $\frac{1}{4}$

$$
\begin{array}{r}
0.25 \\
4\overline{)1.00} \\
-\,8 \\
\hline
20 \\
-\,20 \\
\hline
0
\end{array}
$$

$\frac{1}{4} = 0.25$

B. $\frac{9}{5}$

$$
\begin{array}{r}
1.8 \\
5\overline{)9.0} \\
-\,5 \\
\hline
40 \\
-\,40 \\
\hline
0
\end{array}
$$

$\frac{9}{5} = 1.8$

C. $\frac{5}{3}$

$$
\begin{array}{r}
1.666 \\
3\overline{)5.000} \\
-\,3 \\
\hline
20 \\
-\,18 \\
\hline
20 \\
-\,18 \\
\hline
20 \\
-\,18 \\
\hline
2
\end{array}
$$

$\frac{5}{3} \approx 1.67$

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Check It Out: Example 1

Write each fraction as a decimal. Round to the nearest hundredth, if necessary.

A. $\frac{3}{4}$

$$
\begin{array}{r}
0.75 \\
4\overline{)3.00} \\
-28 \\
\hline
20 \\
-20 \\
\hline
0
\end{array}
$$

$\frac{3}{4} = 0.75$

B. $\frac{6}{5}$

$$
\begin{array}{r}
1.2 \\
5\overline{)6.0} \\
-5 \\
\hline
10 \\
-10 \\
\hline
0
\end{array}
$$

$\frac{6}{5} = 1.2$

C. $\frac{7}{3}$

$$
\begin{array}{r}
2.333 \\
3\overline{)7.000} \\
-6 \\
\hline
10 \\
-9 \\
\hline
10 \\
-9 \\
\hline
10 \\
-9 \\
\hline
1
\end{array}
$$

$\frac{7}{3} \approx 2.33$

The decimals 0.75 and 1.2 in Example 1 are **terminating decimals** because the decimals comes to an end. The decimal 0.333…is a **repeating decimal** because the decimal repeats a pattern forever. You can also write a repeating decimal with a bar over the repeating part.

0.333… = $0.\overline{3}$

0.8333… = $0.8\overline{3}$

0.727272… = $0.\overline{72}$

Example 3: Writing Decimals as Fractions

Write each decimal as a fraction in simplest form.

A. 0.018

$$0.018 = \frac{18}{1{,}000}$$

$$= \frac{18 \div 2}{1{,}000 \div 2}$$

$$= \frac{9}{500}$$

B. 1.55

$$1.55 = \frac{155}{100}$$

$$= \frac{155 \div 5}{100 \div 5}$$

$$= \frac{31}{20} \text{ or } 1\frac{11}{20}$$

You read the decimal 0.018 as “eighteen thousandths.”

Check It Out: Example 3

Write each decimal as a fraction in simplest form.

A. 0.015

$$0.015 = \frac{15}{1{,}000}$$

$$= \frac{15 \div 5}{1{,}000 \div 5}$$

$$= \frac{3}{200}$$

B. 1.30

$$1.30 = \frac{130}{100}$$

$$= \frac{130 \div 10}{100 \div 10}$$

$$= \frac{13}{10} \text{ or } 1\frac{3}{10}$$

Terminating Decimals as Fractions

$$12.041$$

$$= 12\frac{41}{1000}$$

$$= \frac{12(1000) + 41}{1000}$$

$$= \frac{12041}{1000}$$

An alternative way:

$$12.041$$

$$= \frac{12.041 \times 1000}{1000}$$

$$= \frac{12\,041}{1000}$$

Example 2:

$$0.4689$$

$$= \frac{0.4689 \times 10\,000}{10\,000}$$

$$= \frac{4689}{10\,000}$$

Repeating decimals as fractions

Step 1: Multiply the given 10^n where n is the number of digits in the repeating block.

Given: $0.465 \times 10^3 = 465.465$

Step 2: Subtract the given from the result.

$$465.465 - 0.465 = 465$$

Step 3: The given decimal is equal to the fraction whose numerator is the result in the step 2 and whose denominator is 10^n-1.

$$0.\overline{465}=\frac{465}{10^3-1}=\frac{465}{999}$$

Lesson Quiz (ASSIGNMENT)

Write each fraction as a decimal.

1. $\frac{16}{5}$ 3.2

2. $\frac{21}{8}$ 2.625

3. $\frac{7}{10}$ 0.7

4. $\frac{11}{20}$ 0.55

Write each decimal as a fraction in simplest form.

5. 0.42 $\frac{21}{50}$

6. 8.625 $\frac{69}{8}$ or $8\frac{5}{8}$

7. If your soccer team wins 21 out of 30 games, what is your team's winning rate? 0.70