



Converting Fractions and Decimals



Fractions and decimals are two different ways of describing amounts less than 1 or in between whole numbers.

Converting Decimals to Fractions:

Convert the following decimal numbers to fractions or mixed numbers in simplest form.

Example 1: $0.8 = \frac{8}{10} \div 2 = \frac{4}{5}$
 "8 tenths"

Example 2: 41.006
 "41 and 6 thousandths"
 $41 \frac{6}{1000} \div 2 = 41 \frac{3}{500}$

Converting Fractions to Decimals:

Method 1: *Equivalent Fractions or Ratio Tables!*

Example 3: $\frac{3}{25} = 0.12$
 $\frac{3 \times 4}{25 \times 4} = \frac{12}{100}$

3	6	12
25	50	100

 (Arrows indicate multiplying numerator and denominator by 2 to get the next row)

Example 4: $8 \frac{144}{400} = 8.36$
 $\frac{144 \div 4}{400 \div 4} = \frac{36}{100}$
 $4 \overline{)144} \quad \begin{array}{r} 36 \\ 4 \times 36 \\ \hline 144 \end{array}$

Method 2: Division

To **convert** from a **fraction** to a **decimal**, **divide** the numerator by the denominator.
You may need to go several places past the decimal point.

What types of decimals may I run into while converting with fractions and decimals?

A **terminating decimal** is a decimal number that *terminates*, or ends.

Examples: 0.4, 0.075, 1.0002

A **repeating decimal** is a decimal number that contains a pattern of digits in the decimal places that repeats forever.

Examples: 0.3333333..., 0.67676767...

$d \sqrt{n}$

How do we write repeating decimals?

We can use bar notation to show that the decimal repeats forever without actually writing out the numbers forever... nice, right?!

Rewrite the following decimals using bar notation.

a) $0.77777777\dots = \underline{0.\overline{7}}$

b) $31.5858585858\dots = \underline{31.\overline{58}}$

c) $8.765476547654\dots = \underline{8.\overline{7654}}$

d) $0.3194444444\dots = \underline{0.319\overline{4}}$

Convert the fractions and mixed numbers to decimals. Write repeating decimals using bar notation.

Example 5: $4\frac{1}{8} = \underline{4.\overline{125}}$

$1 \div 8$

$$\begin{array}{r} 8 \overline{) 1.000} \\ \underline{-8} \\ 20 \\ \underline{-16} \\ 40 \\ \underline{-40} \\ 0 \end{array}$$

Example 6: $\frac{5}{6} = \underline{0.\overline{83}}$

$$\begin{array}{r} 6 \overline{) 5.0000} \\ \underline{-48} \\ 20 \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 20 \\ \underline{-18} \\ 20 \end{array}$$

Now you try! Write decimals as fractions in simplest form and fractions as decimals. Write repeating decimals using bar notation.

a) $11.5 = 11\frac{5}{10} = 11\frac{1}{2}$

b) $0.66 = \frac{66}{100} = \frac{33}{50}$

c) $0.019 = \frac{19}{1000}$

d) $0.36 = \frac{36}{100} = \frac{9}{25}$

e) $56.2 = 56\frac{2}{10} = 56\frac{1}{5}$

f) $0.901 = \frac{901}{1000}$

g) $\frac{7}{12}$

h) $\frac{11}{16}$

i) $2\frac{4}{9} = \underline{2.\overline{4}}$

$12 \overline{) 7} = \underline{0.\overline{583}}$

$16 \overline{) 11} = \underline{0.\overline{6875}}$

$9 \overline{) 4.0}$