

Lesson 7: Fractions and Decimals

Goals:

- Convert a fraction to a decimal.
- Convert a decimal to a fraction.
- Round decimal answers to required number of decimal digits.

A common way to use fractions in the "real world" is to convert the fraction to a *decimal number*.

Figure 1: Place Value

Hundred thousands	Ten thousands	Thousands	Hundreds	Tens	Ones	.	Tenths	Hundredths	Thousandths	Ten-thousandths	Hundred-thousandths

Decimals are popular as they are easier to type into calculators, money is expressed using decimal numbers, and the amount represented by a decimal number is more easily understood by most people.

Any digits after a decimal point in a number represent part of a whole, just like fractions, except the denominator is always a power of 10 (e.g. $\frac{1}{10}$, $\frac{1}{100}$, $\frac{1}{1000}$...).

The "right most" digit's place value shows which denominator to use when converting to fractions. Digits to the left of the decimal are treated as whole numbers.

Example 1

Convert the following decimal numbers to fractions. Reduce your answer to lowest terms if possible.

a) 0.5

$$\begin{aligned}
 &= \frac{0.5}{1} \\
 &= \frac{0.5 \times 10}{1 \times 10} \\
 &= \frac{5}{10} \\
 &= \frac{1}{2}
 \end{aligned}$$

b) 0.72

$$\begin{aligned}
 &= \frac{0.72}{1} \\
 &= \frac{0.72 \times 10}{10} \\
 &= \frac{7.2}{10} \\
 &= \frac{7.2 \times 10}{10 \times 10} \\
 &= \frac{72}{100} \Rightarrow \frac{18}{25}
 \end{aligned}$$

c) 0.255

$$\begin{aligned}
 &= \frac{0.255}{1} \\
 &= \frac{0.255 \times 10}{1 \times 10} \\
 &= \frac{2.55}{10} \\
 &= \frac{2.55 \times 10}{10 \times 10} \\
 &= \frac{25.5}{100} \\
 &= \frac{25.5 \times 10}{100 \times 10} \\
 &= \frac{255}{1000} = \frac{51}{200}
 \end{aligned}$$

d) -0.35

$$\begin{aligned}
 &= \frac{-0.35}{1} \\
 &= \frac{-0.35 \times 10}{1 \times 10} \\
 &= \frac{-3.5}{10} \\
 &= \frac{-3.5 \times 10}{10 \times 10} \\
 &= \frac{-35}{100} \div 5 \\
 &= \frac{-7}{20}
 \end{aligned}$$

e) -15.25

$$\begin{aligned}
 &= \frac{-15.25}{1} \\
 &= \frac{-15.25 \times 10}{1 \times 10} \\
 &= \frac{-152.5}{10} \\
 &= \frac{-152.5 \times 10}{10 \times 10} \\
 &= \frac{-1525}{100} \div 25 \\
 &= \frac{-61}{4}
 \end{aligned}$$