

Fractions \Leftrightarrow Decimals \Leftrightarrow Percentages

Converting from a fraction to a decimal:

- Turn the fraction into a long division problem.

$$\frac{a}{b} = b \overline{)a}$$

ex. $\frac{1}{4} = 4 \overline{)1.00}$

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

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

Converting from a decimal to a percent:

- Move the decimal point to the right two places.
Ex. $0.25 = 25\%$

Converting from a percent to a decimal:

- Move the decimal two places to the left.
Ex. $25\% = 0.25$

Converting from a decimal to a fraction:

- For a terminating fraction
 - Put digits in the numerator, and a number 1 with as many zeros as equal to the number of decimal places in original number in the denominator.
 - Then reduce to lowest terms.

Ex. $0.25 = \frac{25}{100} = \frac{5}{20} = \frac{1}{4}$

- For a repeating decimal
 - Call original repeating decimal x .
 - Then multiply by enough powers of ten so that the repeating section lines up with itself. Subtract x from $n \cdot x$, and solve for x .
 - Then reduce to lowest terms

Ex.1. $x = 0.\overline{3}$

$$\begin{array}{r} 10x = 3.\overline{3} \\ - x = 0.\overline{3} \\ \hline 9x = 3 \end{array}, x = \frac{3}{9} = \frac{1}{3}, \therefore 0.\overline{3} = \frac{1}{3}$$

Ex.2. $x = 0.\overline{142857}$

$$\begin{array}{r} 1000000x = 142857.\overline{142857} \\ - x = 0.\overline{142857} \\ \hline 999999x = 142857 \end{array}$$

$$x = \frac{142857}{999999} = \frac{15873}{111111} = \frac{1}{7}, \therefore 0.\overline{142857} = \frac{1}{7}$$

Exercises: Convert the following:

Fractions to decimals:

1.) $\frac{2}{5}$

2.) $\frac{3}{4}$

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

Decimals to percents:

4.) 0.5

5.) 0.3333

6.) 1.25

Percents to decimals:

7.) 70%

8.) 82%

9.) 325%

Decimals to fractions:

10.) 0.125

11.) 0.30

12.) 2.125

13.) $0.\overline{1}$

14.) $0.\overline{01}$

15.) $0.\overline{125}$