Fractions, Decimals & Percentages

Vocabulary

Equivalent
The same as.

Denominator
The number on the bottom of a fraction. Always an Integer.

Numerator
The number on top of a fraction. It should always be an integer.

Convert between fractions, decimals & percentages

Key Fact

Any fraction can be written as an **equivalent** decimal or percentage.

$$\frac{1}{2} = 0.5 = 50\%$$

Example

Convert the fraction $\frac{3}{8}$ to a decimal and a percentage.

Solution

Divide the numerator by the denominator.

$$
\begin{array}{r}
0.375 \\
8\overline{)\,3.^{3}0^{6}0^{4}0} \\
\end{array}
$$

$$\frac{3}{8} = 0.375 = 37.5\%$$

Examples

Convert these fractions to decimals and percentages.

a) $\frac{1}{5}$

b) $\frac{3}{4}$

c) $\frac{5}{8}$

Solutions

Convert these fractions to decimals and percentages.

a) $\frac{1}{5} = \mathbf{0.2} = \mathbf{20\%}$

b) $\frac{3}{4} = \mathbf{0.75} = \mathbf{75\%}$

c) $\frac{5}{8} = \mathbf{0.625} = \mathbf{62.5\%}$

Exercise

Convert these fractions to decimals and percentages

a) $\frac{1}{2}$

b) $\frac{1}{4}$

c) $\frac{2}{5}$

d) $\frac{3}{10}$

e) $\frac{7}{25}$

f) $\frac{1}{9}$

Convert these fractions to decimals and percentages

a) $\frac{1}{20}$

b) $\frac{21}{100}$

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

d) $\frac{1}{3}$

e) $\frac{4}{9}$

Convert these fractions to decimals and percentages

a) $\frac{1}{20}$

b) $\frac{1}{11}$

c) $\frac{1}{7}$

d) $\frac{2}{7}$

Solutions

Convert these fractions to decimals and percentages

a) $\frac{1}{2}$ = 0.5 = 50%

b) $\frac{1}{4}$ = 0.25 = 25%

c) $\frac{2}{5}$ = 0.4 = 40%

d) $\frac{3}{10}$ = 0.3 = 30%

e) $\frac{7}{25}$ = 0.28 = 28%

f) $\frac{1}{9}$ = $0.\dot{1}$ = $11.\dot{1}\%$

Convert these fractions to decimals and percentages

a) $\frac{1}{20}$ = 0.05 = 5%

b) $\frac{21}{100}$ = 0.21 = 21%

c) $\frac{3}{2}$ = 1.5 = 150%

d) $\frac{1}{3}$ = $0.\dot{3}$ = $33.\dot{3}\%$

e) $\frac{4}{9}$ = $0.\dot{4}$ = $44.\dot{4}\%$

Convert these fractions to decimals and percentages

a) $\frac{1}{20}$ = 0.05 = 5%

b) $\frac{1}{11}$ = $0.\dot{0}\dot{9}$ = $9.\dot{0}\dot{9}\%$

c) $\frac{1}{7}$ = $0.\dot{1}42857\dot{}$

= $14.\dot{2}85714\dot{}\%$

d) $\frac{2}{7}$ = $0.\dot{2}85714\dot{}$

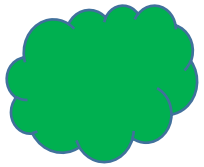
= $28.\dot{5}71428\dot{}\%$

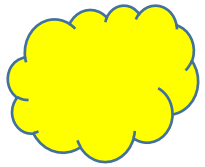
Challenge!

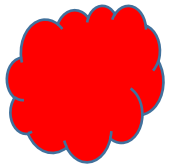
Convert each fraction to a decimal

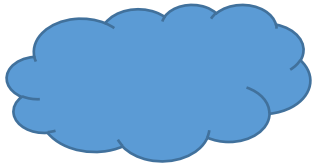
How far can you get?

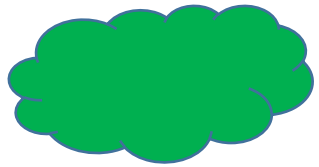
$\frac{1}{2} =$ 

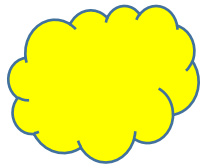
$\frac{1}{3} =$ 

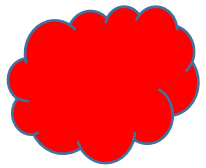
$\frac{1}{4} =$ 

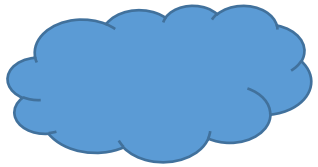
$\frac{1}{5} =$ 

$\frac{1}{6} =$ 

$\frac{1}{7} =$ 

$\frac{1}{8} =$ 

$\frac{1}{9} =$ 

$\frac{1}{10} =$ 

Challenge!

Convert each fraction to a decimal

How far can you get?

$\frac{1}{2} = 0.5$

$\frac{1}{3} = 0.\dot{3}$

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

$\frac{1}{5} = 0.2$

$\frac{1}{6} = 0.1\dot{6}$

$\frac{1}{7} = 0.\dot{1}42857\dot{}$

$\frac{1}{8} = 0.125$

$\frac{1}{9} = 0.\dot{1}$

$\frac{1}{10} = 0.1$

Examples

Convert these decimals to fractions and percentages.

0.6	0.03	0.75

Solutions

0.6	0.03	0.75
$= \frac{6}{10} = \frac{3}{5}$	$= \frac{3}{100}$	$= \frac{75}{100} = \frac{3}{4}$
$= 60\%$	$= 3\%$	$= 75\%$

Exercise

Convert these decimals to fractions and percentages.

a) 0.5

b) 0.1

c) 0.2

d) 0.25

e) 0.15

f) 0.01

Convert these decimals to fractions and percentages.

a) 0.6

b) 0.06

c) 0.36

d) 1.5

e) 3.01

Convert these decimals to fractions and percentages.

a) 0.12345

b) 99.999

c) 0.777777…….

Solutions

Convert these decimals to fractions and percentages.

a) $0.5 = \frac{5}{10} = 50\%$

b) $0.1 = \frac{1}{10} = 10\%$

c) $0.2 = \frac{2}{10} = 20\%$

d) $0.25 = \frac{25}{100} = 25\%$

e) $0.15 = \frac{15}{100} = 15\%$

f) $0.01 = \frac{1}{100} = 1\%$

Convert these decimals to fractions and percentages.

a) $0.6 = \frac{6}{10} = 60\%$

b) $0.06 = \frac{6}{100} = 6\%$

c) $0.36 = \frac{36}{100} = 36\%$

d) $1.5 = \frac{15}{10} = 150\%$

e) $3.01 = \frac{301}{100} = 301\%$

Convert these decimals to fractions and percentages.

a) $0.12345 = \frac{12345}{100000} = 12.345\%$

b) $99.999 = \frac{99999}{1000} = 9999.9\%$

c) $0.777777\ldots\ldots = \frac{7}{9} = 77.77\ldots\%$

Examples

Convert these percentages to fractions and decimals.

75%	30%	8%

Solutions

Convert these percentages to fractions and decimals.

75%

$$= \frac{75}{100} = \frac{3}{4}$$

$$\underline{= 0.75}$$

30%

$$= \frac{30}{100} = \frac{3}{10}$$

$$\underline{= 0.3}$$

8%

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

$$\underline{= 0.08}$$

Exercise

Convert these percentages to fractions and decimals

a) 50%

b) 25%

c) 10%

d) 20%

e) 100%

f) 5%

Convert these percentages to fractions and decimals

a) 15%

b) 99%

c) 48%

d) 7%

e) 49.5%

Convert these percentages to fractions and decimals

a) 0.1%

b) 120%

c) $17\frac{1}{2}\%$

Solutions

Convert these percentages to fractions and decimals

a) $50\% = \frac{1}{2} = 0.5$

b) $25\% = \frac{1}{4} = 0.25$

c) $10\% = \frac{1}{10} = 0.1$

d) $20\% = \frac{1}{5} = 0.2$

e) $100\% = \frac{1}{1} = 1$

f) $5\% = \frac{1}{20} = 0.05$

Convert these percentages to fractions and decimals

a) $15\% = \frac{3}{20} = 0.15$

b) $99\% = \frac{99}{100} = 0.99$

c) $48\% = \frac{12}{25} = 0.48$

d) $7\% = \frac{7}{100} = 0.07$

e) $49.5\% = \frac{99}{200} = 0.495$

Convert these percentages to fractions and decimals

a) $0.1\% = \frac{1}{1000} = 0.001$

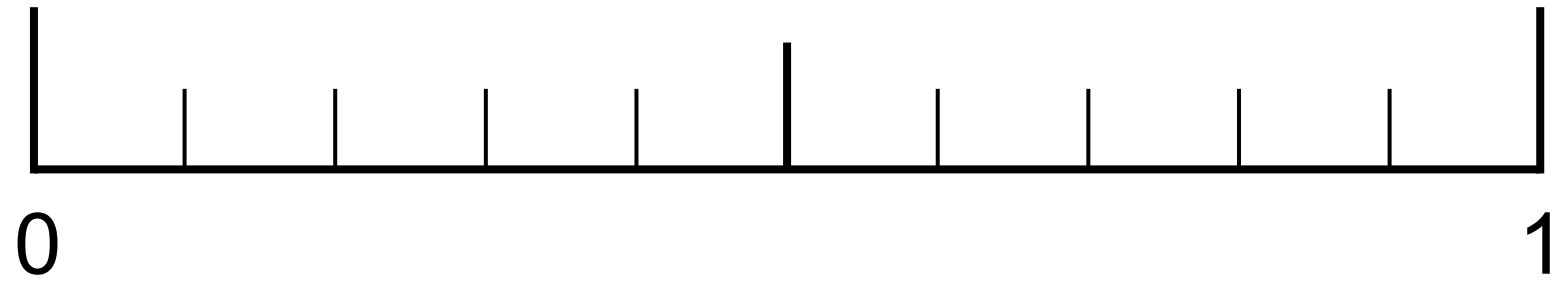
b) $120\% = \frac{6}{5} = 1.2$

c) $17\frac{1}{2}\% = \frac{7}{40} = 0.175$

Example

Write these numbers in order of size, starting with the smallest.

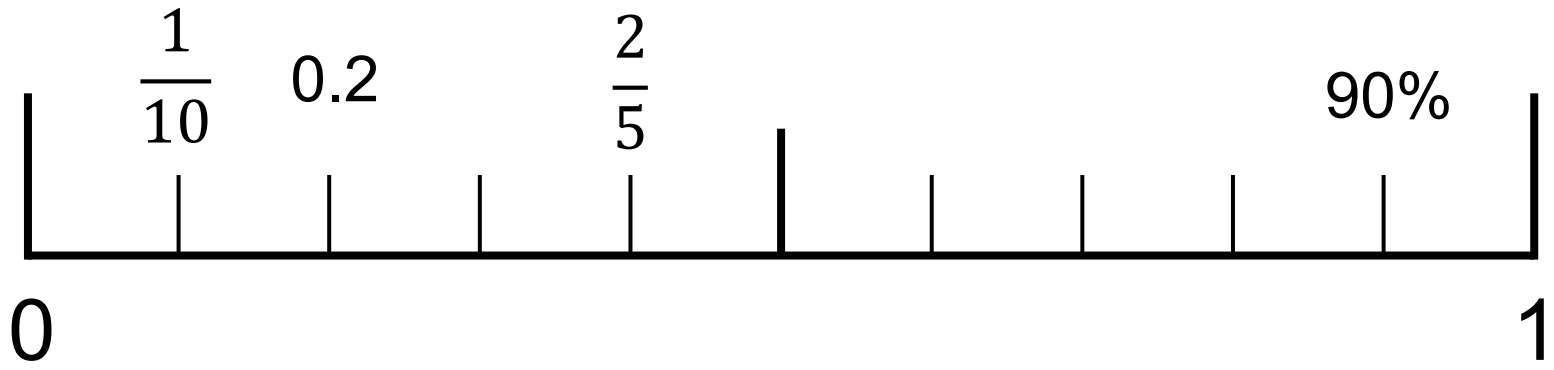
$\frac{2}{5}$ 0.2 $\frac{1}{10}$ 90%



Solution

Write these numbers in order of size, starting with the smallest.

$\frac{2}{5} = \frac{4}{10}$ $\quad 0.2 = \frac{2}{10}$ $\quad \frac{1}{10}$ $\quad 90\% = \frac{9}{10}$



Exercise

Write each set of numbers in ascending order.

1 $\frac{3}{5}$ 0.3 $\frac{7}{10}$ 65%

2 $\frac{3}{7}$ 0.43 $\frac{9}{20}$ 44%

3 $\frac{3}{4}$ $\frac{2}{3}$ $\frac{6}{7}$ $\frac{1}{2}$

4 What number is halfway between $\frac{1}{4}$ and $\frac{1}{2}$?

5 Write down three fractions between $\frac{2}{3}$ and $\frac{3}{4}$.

Challenge

$\frac{9}{10}$ is a fraction that is ‘close’ to 1.

What is the largest fraction less than 1?

Solutions

Write each set of numbers in ascending order.

1 $\frac{3}{5}$ 0.3 $\frac{7}{10}$ 65%

0.3 $\frac{3}{5}$ **65%** $\frac{7}{10}$

2 $\frac{3}{7}$ 0.43 $\frac{9}{20}$ 44%

$\frac{3}{7}$ **0.43** **44%** $\frac{9}{20}$

3 $\frac{3}{4}$ $\frac{2}{3}$ $\frac{6}{7}$ $\frac{1}{2}$

$\frac{1}{2}$ $\frac{2}{3}$ $\frac{3}{4}$ $\frac{6}{7}$

4 What number is halfway between $\frac{1}{4}$ and $\frac{1}{2}$?

$\frac{3}{8}$

5 Write down three fractions between $\frac{2}{3}$ and $\frac{3}{4}$.

$e.g.$ $\frac{33}{48}$, $\frac{34}{48}$, $\frac{35}{48}$

Challenge

$\frac{9}{10}$ is a fraction that is 'close' to 1.

What is the largest fraction less than 1?

There is no largest fraction less than 1.

Exam Style Question

Amelia says that 0.61 is bigger than 0.7 because 61 is bigger than 7.

Is Amelia correct?

You must give reasons for your answer.

Solution

Amelia says that 0.61 is bigger than 0.7 because 61 is bigger than 7.

Is Amelia correct?

You must give reasons for your answer.

Amelia is not correct.

$$0.61 = \frac{61}{100} \quad but \quad 0.7 = \frac{70}{100}$$