

Understanding decimals

Sunday, 12 April 2020 10:48 am

★ By the end of the lesson I would hope that you have an understanding and be able to apply to questions the following concepts:

- What a decimal number is in relation to place value
- How to order and compare decimal numbers
- Convert decimals to fractions
- Convert fractions to decimals

RECAP

We use decimal numbers all the time.

They have a purpose in life.

We wouldn't be able to express money without the use of a decimal number

\$7.45

Note: We must never write money with one decimal place. We're NOT in a posh restaurant!

\$7.40 **AND NOT** \$7.4

Note: Your calculator will give you 7.4 as an answer. It's your responsibility to ensure you write the number in a way which makes sense. The calculator is a dumb piece of machinery.

RECAP: Place Value

You have been doing Place Value since Year 5 (and possibly sooner).

You need to fully understand the concepts behind the words:

- Thousands
- Hundreds
- Tens
- Units
- Tenths
- Hundredths
- Thousandths

And all the others which there are in life!

For example, the number 345.723 is the same as:

100 10 units $\frac{1}{10}$ $\frac{1}{100}$ $\frac{1}{1000}$

3 4 5 . 7 2 3

"4 tens"

40

$\frac{3}{1000}$

Comparing decimal numbers

To compare decimal numbers we simply need to place them in a table and compare which has the highest and lowest numbers.

Example

The following example has been extracted and adapted, with permission, from the Cambridge Essentials Series of textbooks (Year 8 in this case).

Compare the following decimals and place the correct inequality sign between them.

57.89342 and 57.89631

Biggest.

5	7	.	8	9	3	4	2
5	7	.	8	9	6	3	1

 *

$$57.89631 > 57.89342$$

RECAP: Inequalities

We have a number of useful symbols we can use to visually tell someone if one number is greater than, smaller than or the same as another. The symbols are called inequalities

<	less than
>	greater than
≤	less than or equals to
≥	greater than or equals to
LHS = RHS	

Hence, we can now write the above example using an inequality.

$$57.89342 < 57.89631$$

< Biggest

Converting decimals to fractions

This is an important skill which is used in Mathematics.

Again, we need to understand the idea of place value to be able to comprehend what is going on.

Examples

The following examples have been extracted, with permission, from the Cambridge Essentials Series of textbooks (Year 8 in this case).

Convert the following decimals to fractions in their simplest form.

0.725

$$0.725$$

$$\frac{725}{1000} = \frac{29}{40}$$

$$\frac{725}{1000}$$

5.12 Firstly, note that this is better thought of as $5 + 0.12$

1

$$5 + 0.12$$

$$5 \frac{12}{100} = 5 \frac{3}{25}$$

$$5 \frac{12}{100}$$

$$\begin{aligned} \frac{512}{100} &= 5 \frac{12}{100} \\ &= 5 \frac{6}{50} \\ &= 5 \frac{3}{25} \end{aligned}$$

$$6.347$$

$$6 + 0.347$$

$$6 \frac{347}{1000}$$

$$6.347$$

$$\frac{1}{100}$$

$$\frac{6347}{1000}$$

$$6 \frac{347}{1000}$$

Converting fractions to decimals

This is an important skill which is used in Mathematics.

A fraction is simply another way of saying that the numerator is being divided by the denominator.

We can convert a fraction to decimal by simply dividing the numerator by the denominator.

This can be done using pencil and paper methods.

For some questions it's going to be easier to use the calculator.

Examples

The following examples have been extracted, with permission, from the Cambridge Essentials Series of textbooks (Year 8 in this case).

Convert the following fractions to decimals.

$$0 \cdot \frac{1}{10} \frac{1}{100}$$

$$\frac{239}{100} = 2.39$$

$$239 \div 100$$

$$0.\overset{\cdot}{\underset{\cdot}{10}}\overset{-}{100}$$

$$\underline{\underline{2.39}}$$

$$2.39$$

$$2.39$$

$$\frac{9}{25}$$

$$\frac{9}{25} = \frac{36}{100}$$

$\xrightarrow{\times 4}$
 $\xleftarrow{\times 4}$

$$\frac{36}{100} = 0.36$$

$$0.\overset{\cdot}{\underset{\cdot}{10}}\left(\overset{\cdot}{\underset{\cdot}{100}}\right)$$

$$0.36$$

$$0.36$$

$$0.36$$

Note: When we can change the denominator to a multiple of 10, we make life much easier for ourselves as this is nothing more than place value again.