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Fractions, Decimals and Percentages

One of the basic building blocks you need to learn to develop your maths at secondary school is how to convert between fractions, decimals and percentages. They can all have the same values and you need to be able to switch between them confidently.

Converting between fractions and decimals

The key to understanding how to switch between decimals and fractions is knowing that the first decimal place is the 'tenths' and the second decimal place is the 'hundredths'. This means that you can read off the digits after the decimal point as the numerator of a fraction over 10 or 100. You then just need to simplify the fraction.

Worked examples

0.72 means '72 hundredths' which, written as a fraction is 72/100

So, 0.72 = 72/100

(then simplify)

72/100 = 36/50 = 18/25.

Similarly if you are working with a decimal where the only digit is in the tenths column, then you can simply put that as the numerator of a fraction over 10. For example:

0.7 means '7 tenths' which, written as a fraction is 7/10

So, 0.7 = 7/10

To go in the opposite direction, so switching from a fraction to a decimal, simply multiply your fraction up so the denominator is 10 or 100. Then you can write the numerator as your digits after the decimal point.

Worked examples:

3/5 = 6/10 meaning '6 tenths' which, written as a decimal is 0.6

And when you're working with hundredths:

7/20 = 35/100 meaning '35 hundredths' which, written as a decimal is 0.35

Converting between percentages and fractions

Percentage literally means 'out of 100'. So converting from a percentage to a fraction is dead easy because a fraction with a denominator of 100 also means 'out of 100'. So, you can simply take the digits from your percentage and place them as a numerator of a fraction over 100. Then simplify your fraction as far as possible.

To move in the opposite direction (fraction to percentage) simply get your fraction to have a denominator of 100 and then the numerator is your percentage value.

Worked examples:

Example 1 - percentages to fractions

20% = 20/100

Then simplify…

20/100 = 2/10 = 1/5

Example 2 - fraction to percentage

12/25 = 48/100 = 48%

Converting between decimals and percentages

Working with decimals and percentages is an absolute doddle. As you saw earlier, the second decimal place tells you 'hundredths' or 'out of 100' and percent also means 'out of 100'. So, to convert between a decimal and percentage you simply take the digits in the first two decimal places as your whole number percentage. If there are also numbers in the third or fourth decimal place then they become decimals in the percentage.

Worked examples:

1. 25% = 0.25

2. 56% = 0.56

3. 6% = 0.06

4. 0.42 = 42%

5. 0.03 = 3%

6. 0.742 = 74.2%

Practice questions

Write the following decimals as fractions:

1. 0.6

2. 0.24

3. 0.05

Write the following fractions as decimals:

4. 2/5

5. 3/10

6. 3/4

Write the following percentages as fractions:

7. 25%

8. 60%

9. 12%

Write the following fractions as percentages:

10. 7/10

11. 3/20

12. 3/5

Write the following decimals as percentages:

13. 0.27

14. 0.08

15. 0.952