

Simplifying Surds

A surd is in its simplest form when the number underneath the square root sign is **as small as possible** - i.e. it has **no square numbers other than 1 as factors**.



Example Simplify $\sqrt{60}$

1 Find a square number that is a factor of **60**

4 is a square number
and a factor of 60

$$4 \times 15 = 60$$

The square numbers to 12
are: 1, 4, 9, 16, 25, 36, 49,
64, 81, 100, 121, 144

Try to find the **largest square factor** at this stage
so that you can simplify the surd fully in one go.

2 Rewrite the surd as a product of these two factors: $\sqrt{60} = \sqrt{4} \times \sqrt{15}$

3 Evaluate the root of the square number: $\sqrt{60} = 2 \times \sqrt{15} = 2\sqrt{15}$

This is fully simplified because no square numbers (other than 1) are factors
of 15. If this was not the case, you would need to repeat the process.