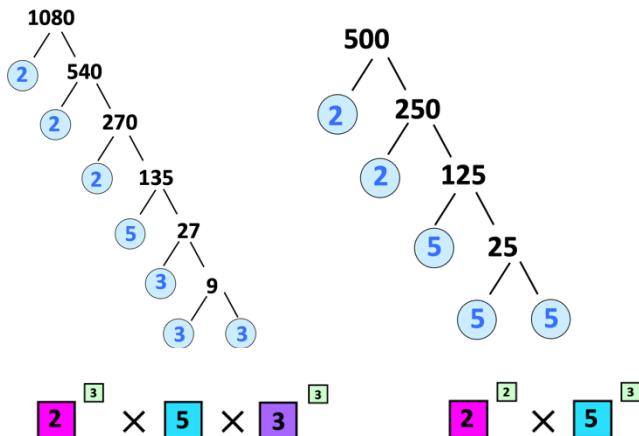


Step 1: Write each number as a product of its prime factors using a factor tree

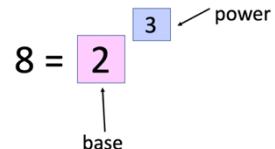
For example **1080 and 500**:

Let's first make a factor tree for each number



Note: You are sometimes given a product of prime factors (see example 2 below)

Step 2: There are 2 ways to deal with this. First of all, let's define a base and power



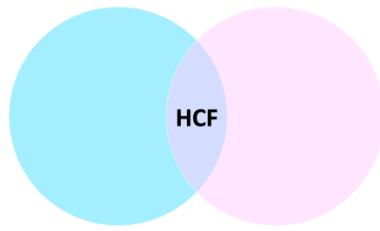
• **Way 1:**

- HCF: Pick the **lowest power** of each base that is **common** to both. Multiply these answers together.
- LCM: Pick the **highest power** of **every** base number that appears. Base number doesn't need to be common this time

Example 1	Example 2
<p>Find the HCF and LCM of 1080 and 500</p> <p>First we make a factor tree</p> <p>$1080 = 2^3 \times 5 \times 3^3$</p> <p>$500 = 2^2 \times 5^3$</p> <p>HCF: Only the pink and blue bases are common So pick the 2 and 5 We want the lowest powers of each of these bases $2^2 \times 5 = 20$</p> <p>LCM: pick every base So pick 2,3,5 We want the highest powers of each of these $2^3 \times 3^3 \times 5^3 = 27,000$</p>	<p>Find the HCF and LCM of $2^2 \times 3^3 \times 5 \times 7^2$ $2^3 \times 5^2 \times 7^3$</p> <p>Let's colour code these</p> <p>$2^2 \times 3^3 \times 5 \times 7^2$:</p> <p>$2^2 \times 3^3 \times 5 \times 7^2$</p> <p>$2^3 \times 5^2 \times 7^3$:</p> <p>$2^3 \times 5^2 \times 7^3$</p> <p>HCF: Only the pink, blue and purple bases are common So pick the 2, 5 and 7 We want the lowest powers of each of these bases $2^2 \times 5 \times 7^2 = 980$</p> <p>LCM: pick every base So pick 2,3,5,7 We want the highest powers of each of these $2^3 \times 3^3 \times 5^2 \times 7^3 = 1,852,200$</p>

- **Way 2:**

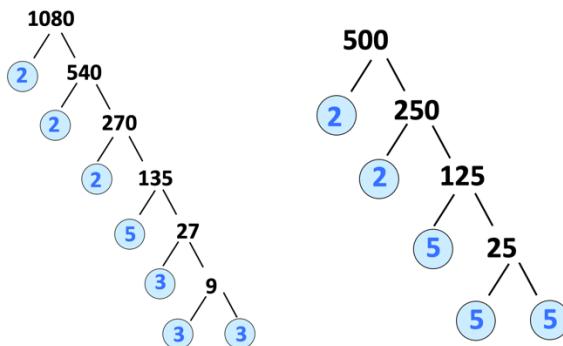
- Draw a Venn diagram



- For HCF: Multiply everything in the middle (common ground) together
- For LCM: Multiply **EVERYTHING** together

Example 1

Find the HCF and LCM of 1080 and 500
We first do a factor tree as above

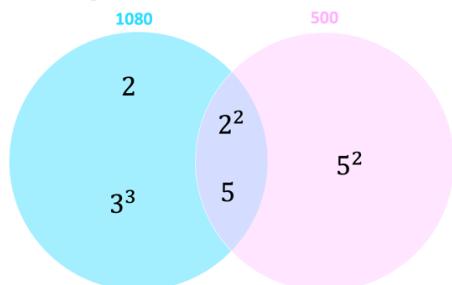


$$2^{\boxed{3}} \times 5^{\boxed{1}} \times 3^{\boxed{3}} \quad 2^{\boxed{2}} \times 5^{\boxed{3}}$$

Draw a venn diagram

We look for the common bases in each number first.
the **pink** and **blue** bases are common to both numbers hence the bases 2 and 5

The **lowest power** of these **common** numbers go into the middle part of the venn diagram, hence 2^2 and 5
1080 must have three 2's, one 5 and three 3's (at the moment it only has two 2's and 1 five) so we need to make sure the circle of 1080 has all this by putting the missing parts in the half moon of 1080 on the left
500 must have two 2's and three 5's (at the moment it only has two 2's and 1 five) so we need to make sure the circle of 500 has all this by putting the missing numbers in the half moon of 500 on the right



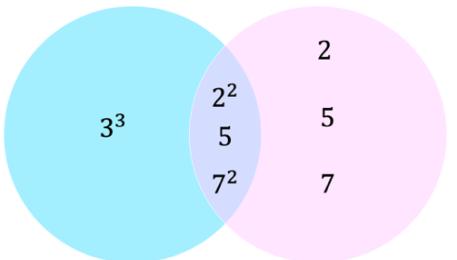
HCF: Multiply everything in the middle (common ground) together
 $2^2 \times 5 = 20$

LCM: Multiply **EVERYTHING** together
 $2 \times 3^3 \times 2^2 \times 5 \times 5^2 = 27,000$

Example 2

Find the HCF and LCM of
 $2^2 \times 3^3 \times 5 \times 7^2$
 $2^3 \times 5^2 \times 7^3$

Draw a venn diagram (see the method for the example on the left first)



$$\text{HCF: } 2^2 \times 5 \times 7^2 = 980$$

$$\text{LCM: } 3^3 \times 2^2 \times 5 \times 7^2 \times 2 \times 5 \times 7 = 1,852,200$$