HCF and LCM: fact sheet

Planner week 6 · Learn these facts

HCF

Factors of 12: 1 2 3 4 6 12

Factors of 18: 1 2 3 6 9 18

HCF = 6

The **biggest** number that goes into both

Highest Common Factor

LCM

Multiples of 4: 4 8 12 16

Multiples of 6: 6 12 18

LCM = 12

The **smallest** number in both times tables

Lowest Common Multiple

Prime factors first

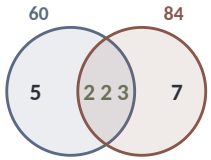
$60 = 2 \times 2 \times 3 \times 5$

$84 = 2 \times 2 \times 3 \times 7$

Write each number as a product of primes

Use factor trees

Venn diagram



Shared primes go in the **middle**

HCF = middle, LCM = everything

HCF from the Venn

middle: 2 × 2 × 3

HCF = 12

Multiply the numbers in the overlap

HCF(60, 84) = 12

LCM from the Venn

all: 5 × 2 × 2 × 3 × 7

LCM = 420

Multiply **everything** in the diagram

LCM(60, 84) = 420

With powers

$A = 2^2 \times 3$, $B = 2 \times 3^2$

HCF: lowest powers = 2 × 3 = 6

LCM: highest powers = $2^2 \times 3^2 = 36$

HCF: lowest power of each shared prime

LCM: highest power of every prime

Which one?

HCF	"biggest that goes into both", sharing into equal groups
LCM	"when will they next happen together"
Check	HCF ≤ smaller number ≤ LCM

Key words

- **HCF** highest common factor
- **LCM** lowest common multiple
- **Common** in both lists
- **Product of primes** 60 = 2 × 2 × 3 × 5

Exam tips

- Small numbers: just list the factors or multiples.
- Big numbers: use prime factors and a Venn diagram.
- HCF is never bigger than the smaller number.
- LCM is never smaller than the bigger number.
- Check your LCM divides by both numbers.
- Powers: HCF takes the **lowest** powers, LCM the **highest**.

Finding the HCF and LCM: fact sheet

HCF and LCM · Planner week 6 · Learn the method

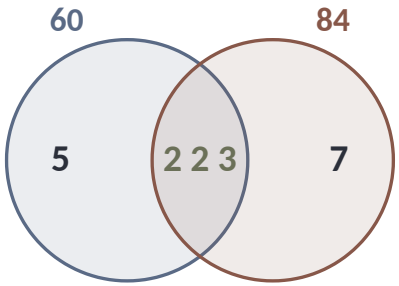
Worked example

QUESTION

Find the highest common factor (HCF) and the lowest common multiple (LCM) of 60 and 84.

ANSWER

$60 = 2 \times 2 \times 3 \times 5$ $84 = 2 \times 2 \times 3 \times 7$



HCF = 2 × 2 × 3 = 12 **LCM = 5 × 2 × 2 × 3 × 7 = 420**

Shared primes in the middle.

How to do it

1. Write both numbers as products of primes.
2. Put the primes they **share** in the middle of a Venn diagram.
3. Put the others in their own circle.
4. HCF = multiply the **middle**.
5. LCM = multiply **everything**.
6. Check: the LCM divides by both numbers.

Model answer:

HCF = **12**, LCM = **420**

Watch out

- Mixing up HCF and LCM.
- Putting a shared prime in both circles as well as the middle.
- Multiplying the two numbers for the LCM (60 × 84 is too big).