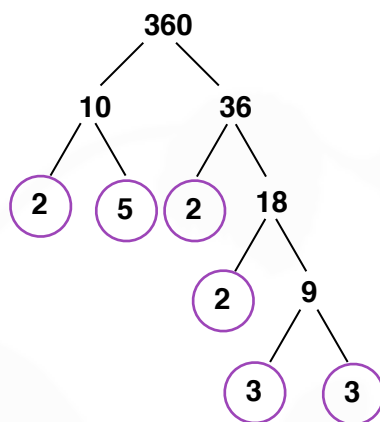


HCF/LCM

Starter

1. **(Review of last lesson)**
Express 360 as the product of prime factors. Give your answer in index notation.

Working:



$$360 = 2 \times 5 \times 2 \times 2 \times 3 \times 3 = 2^3 \times 3^2 \times 5$$

2. Consider the numbers 8 and 20.
- (a) Find the largest factor that is common to both numbers.
- (b) Find the smallest number that both numbers will go into without leaving a remainder.

Working:

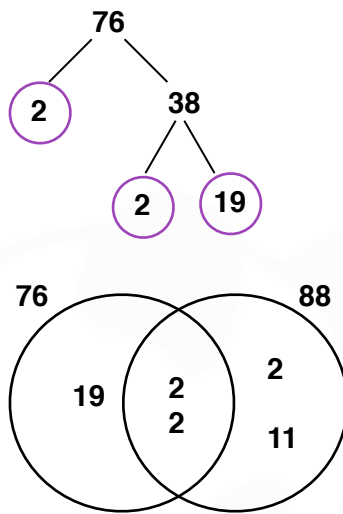
- (a) The factors of 8 are 1, 2, 4, 8.
The factors of 20 are 1, 2, 4, 5, 10, 20.
The largest factor that is common to both numbers is 4.
- (b) It would be useful to write down the multiples of 8 and 20.
8 will go into 8, 16, 24, 32, 40, 48, 56, 64, ...
8 will go into 20, 40, 60, 80, ...
The smallest number that 8 and 20 will go into without leaving a remainder is 40.

E.g. 1 Find the highest common factor and lowest common multiple of these numbers.

(a) 76 and 88

(b) 450 and 660

Working: (a)



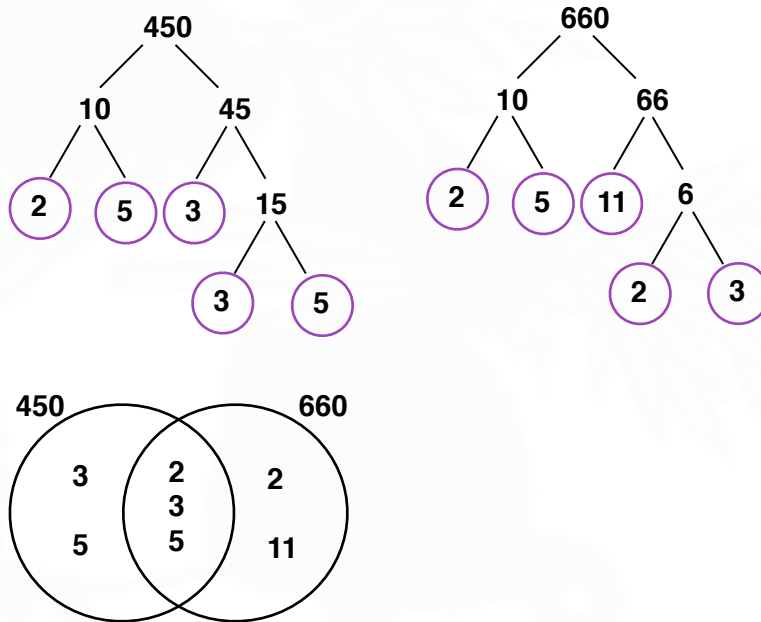
$$\text{HCF} = 2 \times 2 = 4$$

$$\text{LCM} = 19 \times 2 \times 2 \times 1 \times 11 = 1672$$

HCF = product of intersection

LCM = whole diagram

(b)



$$\text{HCF} = 2 \times 3 \times 5 = 30$$

$$\text{LCM} = 3 \times 5 \times 2 \times 3 \times 5 \times 2 \times 11 = 9900$$

HCF = product of intersection

LCM = whole diagram

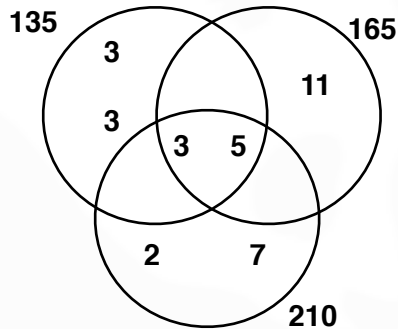
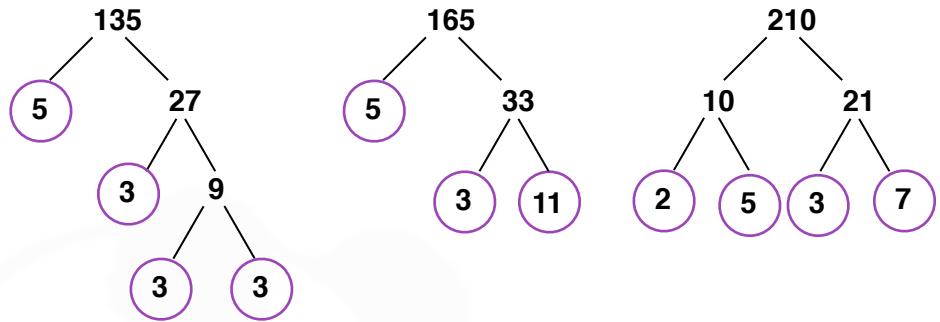
When there are three numbers, the Venn Diagram has three circles.

E.g. 2 Find the HCF and LCM of the numbers

(a) 135, 165 and 210

(b) 102, 612 and 6545

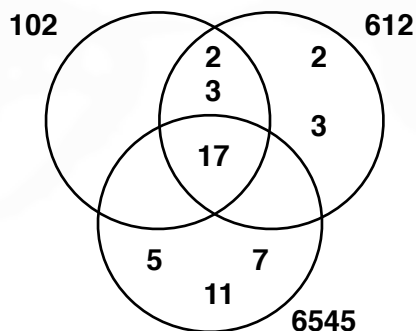
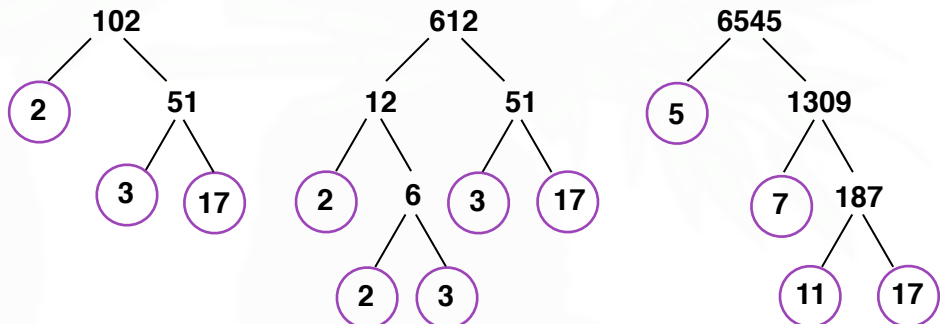
Working: (a)



HCF is $3 \times 5 = 15$

LCM is $3 \times 3 \times 3 \times 5 \times 2 \times 7 \times 11 = 20790$

(b)

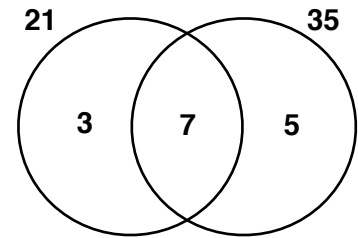


HCF is 17

LCM is $2 \times 3 \times 2 \times 17 \times 5 \times 7 \times 11 \times 3 = 235620$

E.g. 3 Jess swims once every 21 days. Peter swims once every 35 days. They both went swimming today. How many days will it be before they swim on the same day again?

Working: We need to calculate the LCM for 21 and 35
 $21 = 3 \times 7$ and $35 = 5 \times 7$
LCM is $3 \times 7 \times 5 = 105$
They will next swim on the same day in 105 days.



E.g. 4 (a) Find the product of 630 and 360
(b) Find the product of their HCF and LCM. What do you notice?

Working: (a) $630 \times 360 = 226800$
(b) $90 \times 252 = 226800$. They are the same!

E.g. 5 The HCF and LCM of two numbers is 70 and 186 respectively. Given that one of the numbers 210, find the other number.

Working: Let x be the other number.
The product of the numbers equals the product of the HCF and LCM.
 $210 \times x = 70 \times 186$
$$x = \frac{70 \times 186}{210} = 62$$

The other number is 62.

Video: [Finding HCF and LCM](#)
Video: [Finding the HCF and LCM using Venn diagrams 1](#)
Video: [Finding the HCF and LCM using Venn diagrams 2](#)

[Solutions to Starter and E.g.s](#)

Exercise

9-1 class textbook: p127 M5.2 Qu 1-6
A*-G class textbook: p119 M5.2 Qu 5-12
9-1 homework book: p44 M5.1/5.2 Qu 4-12
A*-G homework book: p32 M5.2 Qu 4-10