

A Year 8 homework question

Some students (fewer than 100) are having trouble getting themselves into groups.

When they are in groups of 3, two people are left over.

When they are in groups of 4, three people are left over.

When they are in groups of 5, four people are left over.

When they are in groups of 6, five people are left over.

How many students are there?

If an extra student joined the group the number of students would be divisible by 3, 4, 5 and 6.

The number of students would then be a multiple of 3, 4, 5 and 6. In fact it turns out to be the lowest common multiple (LCM) of 3, 4, 5 and 6. Since 6 is a multiple of 3 you can just find the LCM of 4, 5 and 6. The LCM of 4 and 6 is 12 and the LCM of 5 and 12 is 60. With the extra student there would be 60 students altogether.

There are 59 students.

Check

$$59 \div 3 = 19 \text{ remainder } 2$$

$$59 \div 4 = 14 \text{ remainder } 3$$

$$59 \div 5 = 11 \text{ remainder } 4$$

$$59 \div 6 = 9 \text{ remainder } 5$$