Arithmetic Sequences: Finding the Pattern and Next Term

KS4 MATHEMATICS Ages 11-15 ⏰ 3 min read

What Is an Arithmetic Sequence?

An **arithmetic sequence** is a list of numbers that follow a special pattern. In this pattern, each number is the same amount bigger (or smaller) than the one before it. This amount is called the **common difference**.

For example, the sequence **2, 5, 8, 11, 14** is an arithmetic sequence. Can you see the pattern? Each number is **3** more than the number before it. So the common difference is **+3**.

Think of it like climbing stairs. If each stair is exactly the same height, you go up by the same amount every time. That's what happens in an arithmetic sequence – you go up (or down) by the same number each time.

How to Find the Common Difference

Finding the **common difference** is simple. Just pick any two numbers that are next to each other in the sequence, and subtract the first one from the second one.

Let's try: **10, 15, 20, 25, 30**. Pick any pair: **15 − 10 = 5**. Or try another: **25 − 20 = 5**. The common difference is **+5**.

Arithmetic sequences can also go backwards. Look at **20, 16, 12, 8, 4**. Here, **16 − 20 = −4**, so the common difference is **−4**. Each number gets **4** smaller.

Finding the Next Term

Once you know the **common difference**, finding the next term is easy. Just add the common difference to the last number in the sequence.

For the sequence **3, 7, 11, 15, ?**: The common difference is **+4** (because **7 − 3 = 4**). So the next term is **15 + 4 = 19**.

Think of it like a recipe. Once you know the ingredients you add each time, you can keep making the same dish over and over again, always the same way.

Why Does This Matter?

Arithmetic sequences appear everywhere in real life. They help us predict things like savings (if you save the same amount each week), distances (if something travels the same speed each hour), or even monthly phone bills that stay the same. Understanding arithmetic sequences is a key skill in **algebra** and helps you spot patterns in numbers, which is what all of mathematics is about.