Level 1:

In this level, the numbers are in the order of an arithmetic sequence. This means that there is a common difference(d) between consecutive terms. To work out the common difference(d), you simply find the difference between any two adjacent numbers. For example in the sequence 14,22,30,38,46, I could work out the common difference by doing: 22-14 or 30-22 or 38-30 or 46-38, all of which give the same answer of 8. Once you have found the common difference, you can then subtract (common difference * n), so you are subtracting 8,16,24,32,40 from the sequence which results in 6,6,6,6,6 Therefore, the shift is up 6. If the difference between the (common difference * n) and the sequence is negative, then it is a shift down.

Sequence: 14,22,30,38,46

Common difference * n: 8, 16, 24,32,40

Subtraction: 6, 6 , 6 ,6 ,6

So, for the example used above the table is 8, it is shifted up by 6.

Level 2:

Here, you use the same method to find the common difference. Lets use a new example – 21,35,49,63 and 77. The common difference is 35-21 which is 14. Hence, the table is 14. Similar to above, you then subtract (common difference * n) from the sequence, so you are subtracting 14,28,42, 56, 70 from 21, 35, 49, 63 and 77 which results in 7, 7, 7, 7, 7, 7.

Sequence: 21, 35, 49, 63, 77

(common difference * n) = 14, 28, 42, 56, 70

Subtraction: 7, 7 , 7 , 7 , 7

So, for the example used above the table is 14, it is shifted up by 7.

Level 3 and 4:

In this question, you should first reorder the sequence given to you to increasing order. For example, you are given 128,213,60,264,179. The new version would be 60,128,179,213,264. First, work out the difference between any two numbers next to each other – for example do 179-128 which is 51. Then work out the difference between another pair of numbers that are next to each other(one of the numbers may have been used for the previous subtraction previously), so for example do 213 and 179 which is 34. Noticeably, the differences are different – 51 and 34. So you should find the Highest Common Factor of the two, which is 17 in this case, which will give you the table. Then, for each number in the sequence find the closest table that is less than that number. So for the example it is 51, 119, 170, 204, 255. Then, calculate the difference between the closest table and the ordered sequence which is 9,9,9,9,9.

Sequence: 129,213,60,264,179

Ordered Sequence(OS): 60,128,179,213,264

Difference: 68, 51, 34, 51

Highest Common factor for difference: 17

Table closest to OS: 51,119,170,204,255

Diff btwn tab and OS: 9, 9, 9, 9, 9

So, for the example used above the table is 17, shifted up by 9