NUMBER REPRESENTATION AND CALCULATION

What does it mean to rewrite a number to a different base?

When a number is rewritten to a different base, it is converted using different digits that correspond to the coefficients on the powers of the new base. If the numeral has three places, multiply each digit in the number by the place value for that digit, and then add the products.

1 is the ones place 10^1 is the tens place 10^2 is the hund by place... and so on. For example, when we write 126, we have a 1 in the hundreds place, a 2 in the tens place and a 6 in the ones place, so we can rewrite 126 as (1 x 10^2) + (2 x 10^1) + (4 x 1)

What does it mean to add or subtract two or three numbers to a different base?

Carrying rules differ depending on whether you're adding or subtracting. When we get a number 10 or larger in base 10, we carry all the place values except the ones. When adding for any base, if you get a number greater than or equal to the base, you must carry all place values greater than the ones place. Subtraction is similar, but you must know when to borrow.

Why do we learn to work with numbers in different bases?

We gain a better understanding of our number system by studying other bases. It simplifies polynomial division because it is simply long division in base x.