C2 - Chapter 1 - Algebra and functions

* Any polynomial $f(x)$ can be divided by a given linear expression using long division
  - Remember that we are always trying to match the coefficient of the highest power of x
  - In case one of the powers of x is missing you can add it "artificially" with a coefficient of zero.
    eg Write x^3+2x as x^3+0x^2+2x+0

* Factor theorem: If $f(x)$ is a polynomial and $f(k)=0$ then $(x-k)$ is a factor of $f(x)$.

* Remainder theorem: If $f(x)$ is divided by $(ax-b)$ then the remainder is given by $f(b/a)$.

* The factor theorem is a quick way of finding linear factors of cubic or more complicated polynomials. So, if you are asked to factorise a given polynomial, start by checking "nice" values of x $(\pm 1, \pm 2)$ to find a factor. However, in order to factorise fully, you will still need to use long division

* If you use the factor theorem to show that eg $x+3$ is a factor of $f(x)$ remember to write a statement at the end saying
  $f(-3)=0$ $\therefore$ $x+3$ is a factor of $f(x)$ AS REQUIRED