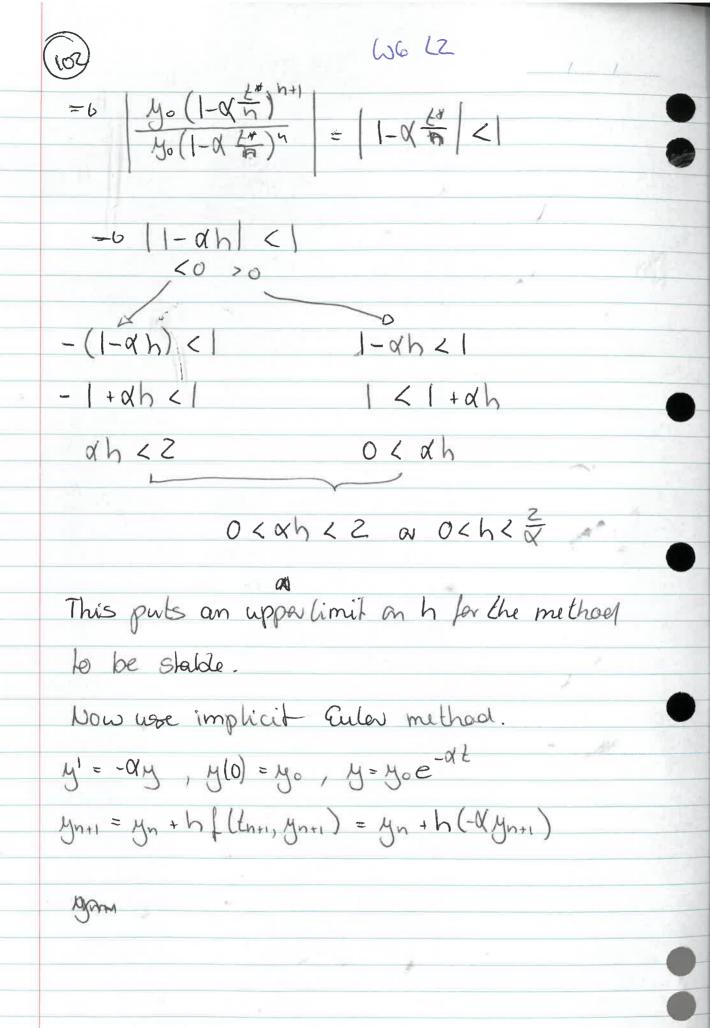
Explicit Euler:

Study the behaviour at a point to and set

$$t^{\alpha} = t \cdot h = h \quad and \quad h - \infty$$

using this we have

to get this convergence are need,



WG LZ



yn+1 + h & yn+1 = yn

(1+dh) yn+1 = yn

Mn+1 = (Hah)

y, = (1+ah), yn = (1+ah)h

again: y(t\*) ~ yn = (1+d+) n and n-> &

= 40 e - at

(1+dh) does not grow "explore" as we have

x >0 and h is fixed and h >0

To ensure convergence we need (I+orh) < 1

which we have for anon d >0 and h >0!

This is called absolute stability. This is desirable in numerical methods.



## State monts on shiftness:

- absolute stability applied to a system with a my initial condition is forced to use, to ih a contain interval of integration, a steplength which is excessively small in relation to the smoothness of the exact solution in that intervall, then the system is said to be stiff in that intervall
- Stepsize.

  Stepsize.
  - of the solution decay much more rapically
    -than others.

Systems of ODES

Most ODEs of higher order can be territen as a system of first order ODEs. We can therefore use known methods to

Solve These.

Example equation for the pendulum

0

write as system of ODEs

let y = 0

System of ODEs:

giren.