Induction - talking about "inducting" over a set

e.g.
$$(1) / N = \mathbb{Z}_{>0}$$

Chat do you want S to have so that you

can induct over 8?

1) S should home a min Base case: P(min S)

→ M says

2) "Thru showd be a

notion of "next number"

S=Z, Q work; well -ordred

 $k \Rightarrow k+1$

first step

min & should exist

$$\rightarrow$$

→ J says pattern/sequence

→ Ja "complete an elementory 8tep1

ay = any + an-2

1 1

1>3 S={nez|n33}

Induction step: assume a step
prove the rest step

So Z, Q (D) doesn't hold for them

Joseph Dale Q?

"I g think so?" - A.

"Don't think so" - M.

No - J.

No - J.

No - J.

NO - WHY IS THAT

Say a \(\omega \) and \(\omega \) is the "rext rational \\ = \quad \text{number".} \\
\text{What about } \(\frac{a+b}{a} \) ?

 $P(K) \rightarrow P(l)$ where l is the next number of r

in Q no next number =

Assuming we're trying list Q wrt <

There's a Q has a "next number"

wery

Q Q no w/ a careat

R- (1)4 (2) NO!

you have a place to start

you have a place to go resit

In thory, you can do induction on a with a certain ordining $\begin{cases} 0, \frac{1}{2}, 1, \frac{3}{2}, 2, \dots \end{cases}$ $\left(k \Rightarrow k + \frac{1}{2}\right)$

H you lookat a question

Besc _ where to start? 25

Induction - k => K+1

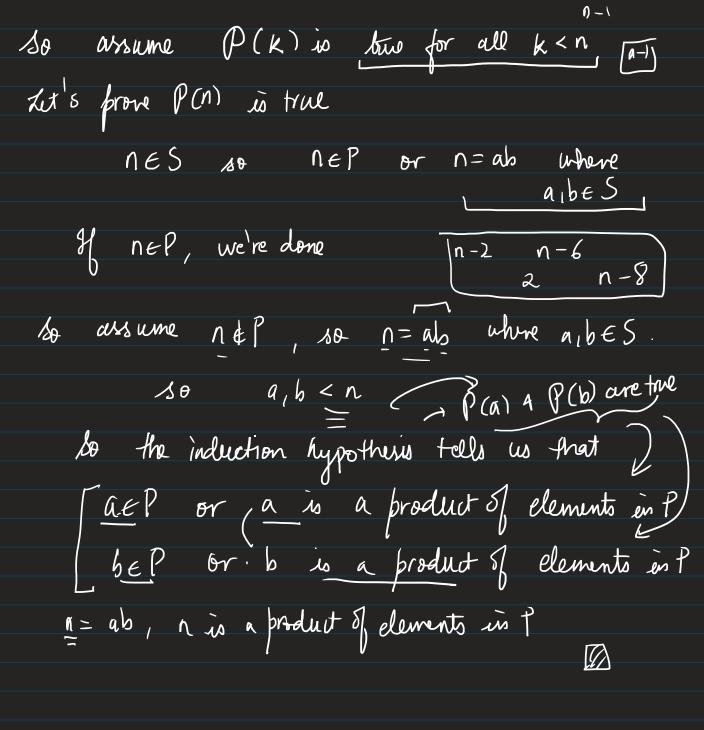
assume k — do 9 just hove to assume one step

or can I assume more than one step IN--- A K-2 ^ K-1 A R -> K+1 "Strong induction" a_{k-1} a_{k-2} = 3 or more consecutive indicas. $P(K) \Rightarrow \mathcal{T}(k+1)$ $\leq diff$ P(I) A ··· A P(K) => P(KH) S = { i & Z | i > 2 } P=S wl property 2,3EP

and nes thun nes or n=ab, a, bes n E S

P

product elements from S. P(n): nEP or n is a product of clements from base case is P(2) i.e. to show 2EP or 2 is Given 2EP. So P(2) is true.



But we didn't have $2^{k} = 2l$ but's prone for a^{k+1} but assume $a^{k} = 2l$ that a^{k-1} was true $a^{k+1} = a(xl)$, $a(a^{k+1}) = a(xl)$, $a(a^{k+1}) = a(xl)$

$$k \Rightarrow k+1$$

$$i(k, then k+1)$$

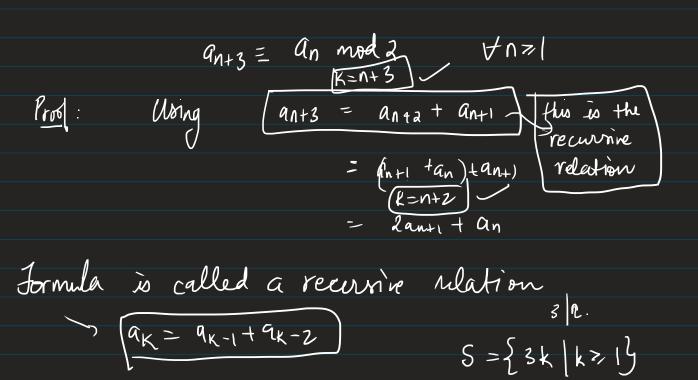
$$k \text{ is true } \times$$

$$2 \text{ is the } \longrightarrow 3 \text{ sign}$$

$$k \Rightarrow k+1 \text{ is true} \longrightarrow$$

$$2 \text{ is the } \longrightarrow$$

$$2$$



 $a_{n+3} = a_{\overline{n}} \mod 2$ = n+3 i.s.